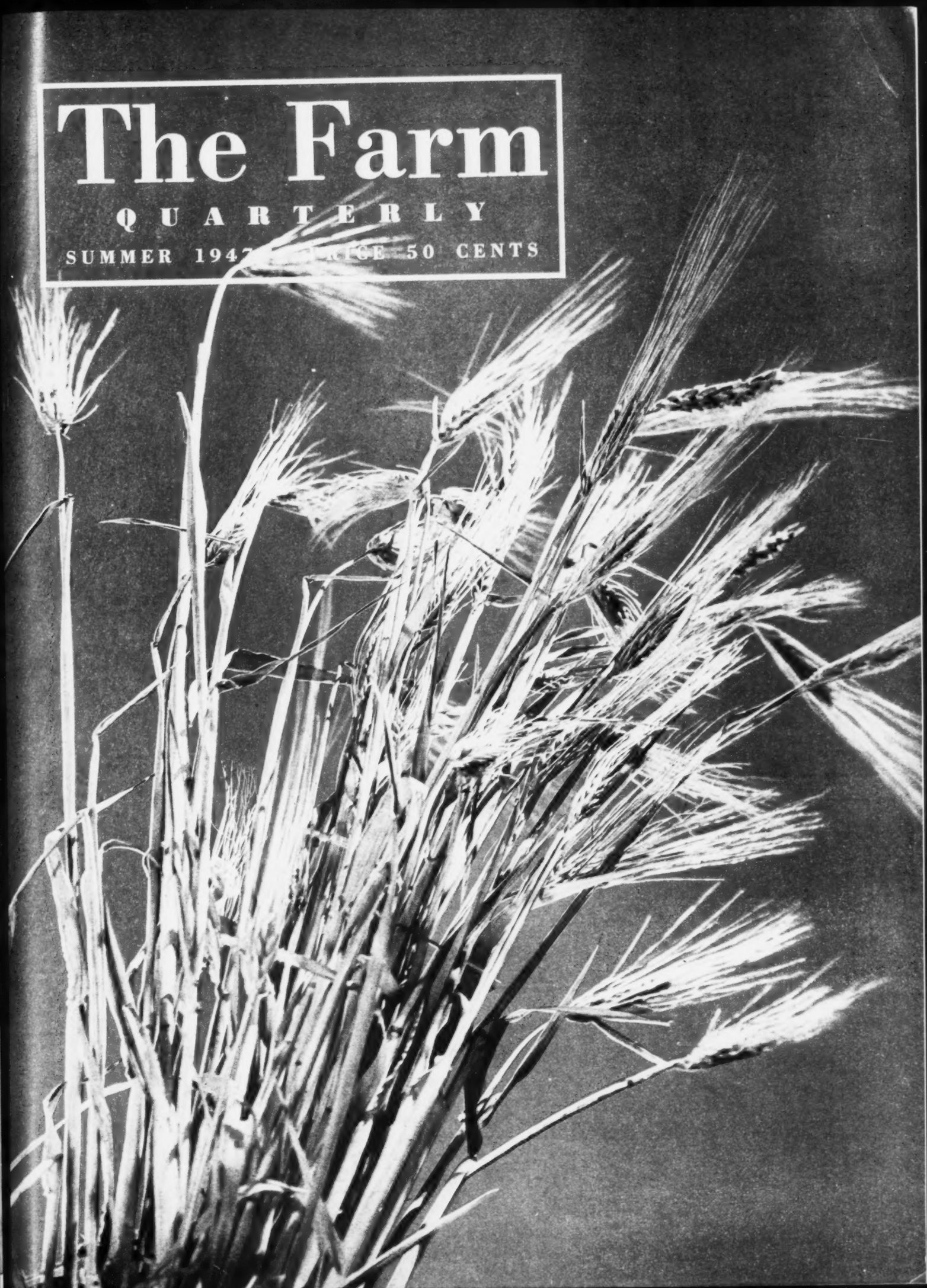
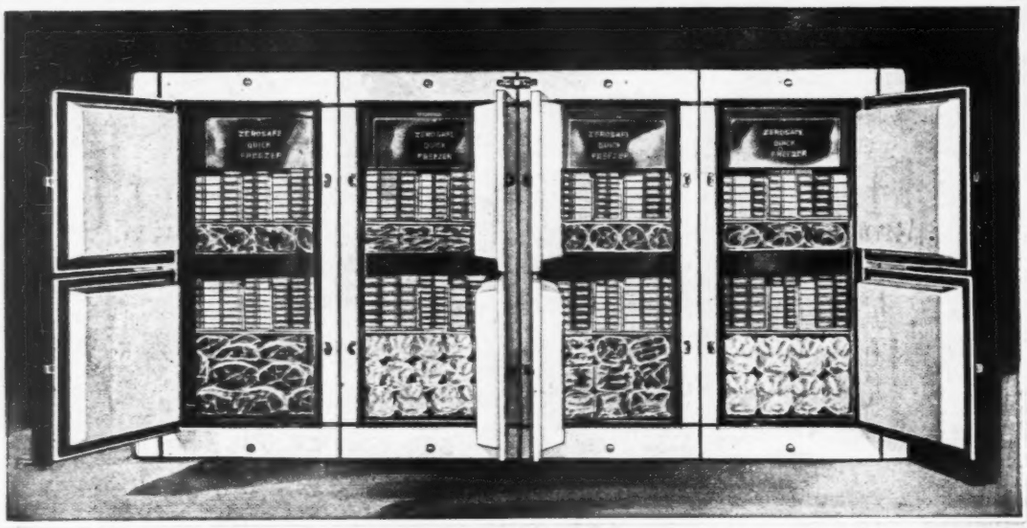
# The Farm

QUARTERLY

SUMMER 1947 PRICE 50 CENTS





Wilson ZEROSAFE Farm Freezer
Sectional Model FF-120
Capacity: 120 Cubic Feet.

# WILSON FREEZERS ARE TIME-TESTED

YEARS OF DAILY USE since 1939 by enthusiastic owners of Wilson "ZEROSAFE" Freezers are your guarantee that the new Wilson "ZEROSAFE" is TIME-TESTED in rugged efficiency, durability, and capacity. Wilson's YEARS OF EXPERIENCE bring you the Wilson-pioneered features of front-opening convenience, real usability, long life and gleaming beauty in a complete range of sizes from 15 cu. ft. to 120 cu. ft. to freeze and store fresh foods for daily use the year round.

## VALUABLE GUIDE FREE

Send your name and address today to Dept. 51 for your free copy of the "Wilson Farm Freezer GUIDE to Better Living," an invaluable booklet on the production of super-quality home-frozen foods.

**WILSON REFRIGERATION, INC.**
SMYRNA DELAWARE

*Build Your Future*

**WITH THE HELP OF**

# INTERNATIONAL HARVESTER

**A NEW line of INTERNATIONAL Trucks, ready for you on the *40th Anniversary* of these famous trucks! New styling, new economy, new ease of operation, and rugged International stamina. See your dealer. Fit a new International Truck into your plans for the future.**

Millions of men—and their fathers and grandfathers before them—have built their farming careers on the long line of International trucks, tractors and machines that stem from the invention of the McCormick Reaper, 116 years ago. They built *soundly* for their future.

There is always a FUTURE for all men. . . . Build for yours, *now*—with the help of a greater International Harvester and the leadership of the experienced dealers who serve you under the IH symbol and the Triple Diamond emblem that identifies International Trucks.

All of International Harvester's long-promised products—new International Trucks (see above), new machines and methods for improved handling of crops in all seasons, new developments in the *FARMALL System—will be on their way to the farmers of America as fast as we can build them.

Keep in close touch with your International Harvester Dealer. Count on him to do his level best to deliver the International equipment you will need in building for the future.

**INTERNATIONAL HARVESTER COMPANY**
180 North Michigan Avenue Chicago 1, Illinois

Tune in James Melton on "Harvest of Stars" every Sunday. NBC Network. See newspapers for time and station.

***FARMALL Tractors are in full swing again this year as the most popular farm tractors in the world. The four Farmalls, A, B, H, and M, with the broad range of Farmall machines, play a major role in the success story of American farming. Watch for new developments, *new surprises*, to be announced in the Farmall System!**

***FARMALL is a *registered trade-mark*.**
**ONLY International Harvester builds FARMALL Tractors..**

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*Haul with* **INTERNATIONAL TRUCKS**

*Farm with* **FARMALL* TRACTORS**

# FOR BETTER FARM INCOMES and BETTER FARM LIVING

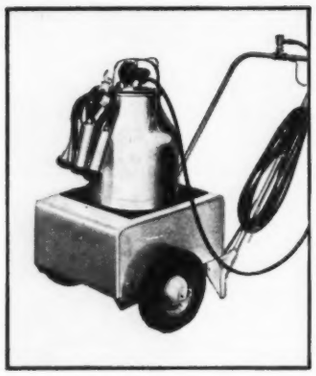
## NEW DE LAVAL PRODUCTS

### New De Laval *Magnetic Speedway* Milker

De Laval engineered for still better, faster, cleaner De Laval milking. New stainless steel unit . . . new Pulso-Pump with metered lubrication . . . and many other new features.

### New De Laval Sterling Milker

Another new postwar De Laval Milker for still better milking performance. New from stainless steel units to vacuum pump. Compare with other pneumatic pulsator milkers!

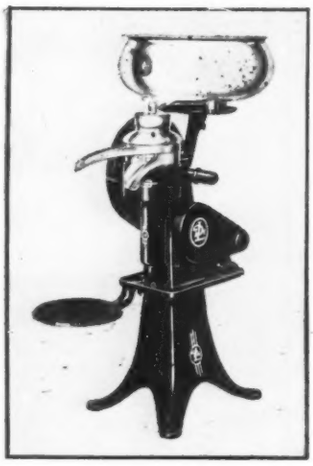


### New De Laval Portable Milker

The new De Laval Milker of many profitable uses! Streamlined and handy—single or double De Laval Sterling units. Can be converted to pipe line milker when and if desired.

### De Laval Junior Separators

Ideal for the smaller herd owner. Provide De Laval clean skimming and easy cleaning at lowest cost. Produce highest quality butterfat. Easy to wash in 2 minutes. Hand or motor drive. Four sizes.

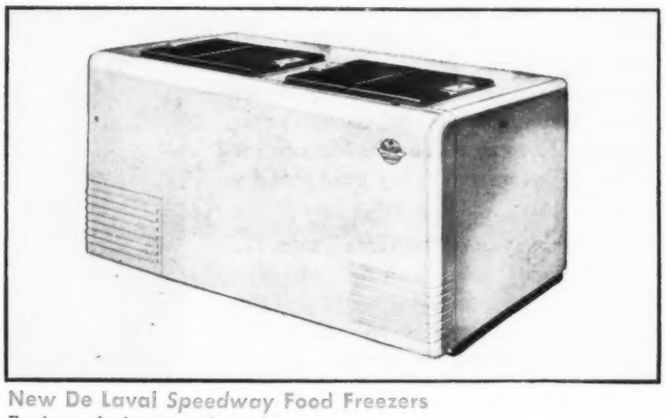


### New De Laval World's Standard Series Separators

The cleanest skimming, easiest-to-clean separators ever built. Every part milk touches is stainless steel—bowls, supply cans and covers with open discharge type spouts. Will earn more and cost less per year of use. Three sizes. Hand or motor drive.

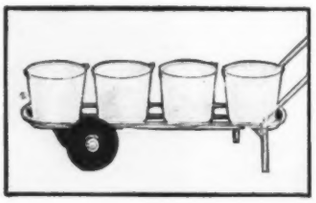
### New De Laval *Speedway* Water Heater

De Laval engineered for the dairyman. Supplies 12 full gallons of 185° water safely, dependably and at low cost. A "must" for proper sterilization. Inner tank of heavy copper; excessive mineral deposits cannot form; pours "pailful in a flash."



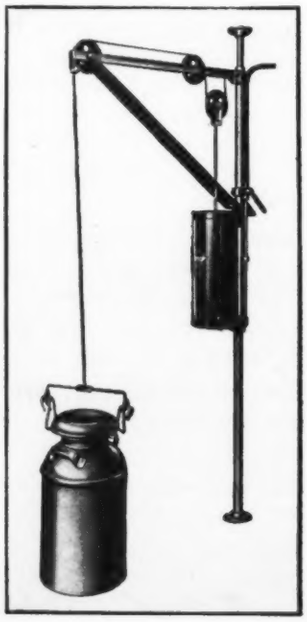
### New De Laval *Speedway* Food Freezers

For better food preservation and better farm living. Beautiful in appearance—dependable and economical in operation. Two sizes—16½ cu. ft. (illustrated) and 35 cu. ft. Great new products with a famous old name you know well!



### New De Laval *Speedway* Milking Truck

Complete with strip cup and four pails for hot water, clean udder towels, chlorine solution and used towels for most effective use of fast milking routine. Helps systematize your profitable, fast milking operation.



### New De Laval *Speedway* Vacuum Can Hoist

Takes the work out of loading and unloading the milk cooler. Operates on 15 inches of vacuum supplied by milker pump.

**See Your De Laval Dealer First**

De Laval

DE LAVAL SPEEDWAY

THE DE LAVAL SEPARATOR COMPANY

NEW YORK 6, 165 BROADWAY — CHICAGO 6, 427 RANDOLPH ST. — SAN FRANCISCO 19, 61 BEALE ST.

# *Who says you have to be Born a good cook!*

**Any Cook Can Be Sure** of perfect results on the new, 1947 Electric Ranges by Westinghouse. They're so *easy to use*, so *fast*, so *sure* in their uniform cooking results.

**Exclusive Tel-A-Glance Switches** cut out guesswork. Faster-than-ever Corox units provide right temperatures for all types of surface cooking. The new, fast Deep Well Cooker *now* deep-fries, steams, boils. Also does most types of surface cooking. Ovens have balanced heat, waist-high broilers.

**Beautiful to look at . . . Still more beautiful in Performance,** these new Ranges, and many other Westinghouse electric appliances, are on their way to you now. They'll save you endless work. See them at your Westinghouse retailer's.

## Every house needs Westinghouse

*Maker of 30 MILLION Electric Home Appliances*

WESTINGHOUSE ELECTRIC CORPORATION • PLANTS IN 25 CITIES • OFFICES EVERYWHERE • APPLIANCE DIVISION, MANSFIELD, OHIO

Tune in Ted Malone . . Monday through Friday . . . 11:45 A.M., E.D.T. . . ABC Network

● Changing the farming pattern of his community from the old one-crop cotton system to a program of balanced farming earned for M. P. Moore, Senatobia, Mississippi, election to the Champion Farmers of America in 1944. On the 15,000 acres which he owns or manages, he pioneered soil conservation methods which are now accepted practice. He proved that legumes and other feed crops can be grown, and that properly managed rundown land will profitably support livestock. On a greatly reduced acreage he grows as much cotton as was ever produced on his farms under the one-crop system, and on the acres removed from cotton production he raises feed for hundreds of cattle. The purebred Polled Herefords on his Circle "M" Ranch are among the best. For four consecutive years his auction prices have set new world records. CMR Rollo Domino 28th topped his 1946 sale at $28,000, while 50 head sold at the record high average of $2,588. His many tractors are equipped with Firestone Ground Grip tires, and he says that the new Firestone Champion Ground Grip is the best tire he has ever used.

NOTE: *For more information about Champion Farmer Moore, write to The Firestone Tire & Rubber Company, Akron, Ohio, and ask for booklet on "M. P. Moore, Champion Farmer."*

# Champion Farmer Moore Uses Firestone CHAMPION GROUND GRIPS

**M. P. MOORE**
Circle "M" Polled Hereford Ranch
Senatobia, Miss.

THERE are four sound reasons why men like Champion Farmer Moore are putting their tractors on Firestone Champion Ground Grips: (1) *they clean up to 100% more effectively;* (2) *they pull up to 62% more;* (3) *they last up to 91% longer; and* (4) *they roll more smoothly on the highways.*

The extra high, curved, connected traction bars make this superiority possible. Shaped like a pyramid, they cut into the soil with a sharp, cleaving action. Mud falls from them freely because the space between the bars is wider at the shoulders than near the center of the tread. The bar connections brace and strengthen the tread and give the tires a powerful "center bite" in the very heart of the traction zone. The tires roll smoothly because the curved, connected bars are in continuous contact with the highway.

It will pay you to insist upon Firestone Champion Ground Grips for your tractor. They cost no more than ordinary tires.

*Listen to the Voice of Firestone every Monday evening over NBC*

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**OUT CLEANS**
**OUT PULLS**
**OUT LASTS**
**ANY OTHER TRACTOR TIRE**

# Farm's Pictures

The following list, page by page, shows the source of each picture in this issue. When more than one source is represented on a single page, credit starts at upper left to right, top to bottom.

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**THE FARM QUARTERLY**
**22 East 12th St., Cincinnati 10, Ohio**

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**Fred Knoop**.....**Managing Editor**

**Mary Berluti**.....**Editorial Secretary**

**Wm. D. Zaeh**.....**Production Manager**

**Aron M. Mathieu**.....**Business Manager**

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***Contributing Editors:*** **Ray Dunn, Ralph Kenney, Robert Graham, Dave Roberts, Charles A. Reese, Banner Bill Morgan, George D. Scarseth, Myron S. Hazen, B. J. Killham, J. W. Schwab, Charles Krutch, Virgil Overholt, Katharine A. Smith, B. G. DeWeese, G. W. Salisbury, J. E. McClintock.**



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Everyone likes to work in the yard or garden when there are Dandy Boy Implements to make the job so easy!

DANDY BOY IMPLEMENTS

# LETTERS

**QUITTER!**

Sir:

We would like to compliment Mr. Joseph Hussey in his very modest expression of his ambition since he has acquired 35 acres of land in the country and wants to know "all about farming."

After spending fifty years of our lives on 300 acres of land trying to achieve a portion of Mr. Hussey's ambition, we have now acquired a home in an Ohio city which we soon hope to occupy. Our life's ambition now is to become President of the Principal Banking Institution, President of the Chamber of Commerce and acquire sufficient knowledge in medical science to care for any and all of our health problems.

Mr. and Mrs. Joseph Baggs
3503 Woodland
Ames, Iowa

**SOFT RED WINTER WHEAT**

Sir:

The Farm Quarterly is all that any farmer could ask for, whether he be a specialist in a given field or just "a plain dirt farmer".

I am a specialist in small grains, principally soft red winter wheat. My father and I own and operate a fourteen hundred acre farm of level river bottom land. I am principally interested in articles dealing with small grain crops, soil conservation, new scientific developments in agriculture, such as improved seed varieties, new methods of weed and insect control.

I am keeping a complete set of The Farm Quarterly magaines for reference.

Howard W. Kaseberg
Granite City, Illinois

**WHICH WAY TO LISBON UNIVERSITY?**

Sir:

I am enclosing the copy of a letter which is typical of a great many we have received asking the location of the University of Lisbon in Maine.

We would consider it a pleasure if you would inform the people that there is no such a place and that John Gould is considered a humorist in his own right. Apparently some of your readers did not realize that this was a satire.

A. O. Shaw, Head
Dept. of Animal Industry
University of Maine
Orono, Maine

IT TOOK A SMART FARMER and a CLEVER ENGINEER

TO BUILD THE PRINCIPLE OF

Dynamic Balance

INTO A FARM LOADER

The men who designed Super Six know the many farm chores to be done. This modern loader is engineered with hydraulic "muscles" to banish "backbreak" from farmwork. Because it's precision built and dynamically balanced, loads are elevated with minimum power. No strain is centered on tractor or axles—*entire* frame supports the balanced weight, at all times. Many important reasons make Super Six the best buy.

*Gets under the load and Lifts!*

FITS MOST ROW CROP TRACTORS

Super Six

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FARM LOADERS

Read the Evidence

*This* BOOKLET *tells the* HOW— *and* WHY

SEND FOR YOUR COPY TODAY

SUPER SIX MFG., INC.

806 Plymouth Bldg., Minneapolis, Minn.

*Write below name, address, tractor make* • MAIL

# Freed from FLIES
## STOCK THRIVES

## Most pests surrender to DOW DDT

Results obtained with DDT are even better than hoped for. Reports from growers, gardeners, farmers and stockmen continue to confirm the belief that DDT is one of the most effective pest control materials yet developed.

Dow DDT formulations, developed for specific applications, are winning favor for their dependable high quality.

They are recommended as superior controls for bugs that ruin potato vines, for codling moths that destroy apples, for insects so troublesome to livestock and for all other pests that succumb to DDT.

DOW DDT-50%-WETTABLE—Make a note of this formulation. Results show it is doing a grand job in reducing the pest population when sprayed around barns, stables, feeding places and directly on farm animals. A wettable powder, it leaves a whitish residue—which remains effective long after spraying. Stock thrives when freed from flies. Results can be measured by the greater gain in weight.

For the right Dow DDT formulation, consult your local experiment station, county agent, qualified dealers.

*AGRICULTURAL CHEMICAL DIVISION*

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN


## FIELD NOTES

### CHEMICAL WEED KILLERS AID TO BIGGER CROPS WITH LESS LABOR

Like DDT formulations, chemical weed killers are in the news. Heretofore, it took laborious and costly mowing, cultivating and digging to get rid of weeds. Now, reports show, many farmers are adopting the chemical method. They do an easy and effective job by spraying with Dow Weed Killers. Weeds absorb the chemical and wither away. The result is bigger crop with less labor. Dow has developed a number of these new chemical weed killers for specific applications. Your county agent, state experiment station, weed control commission, your qualified dealer have complete information.

### DN-111 RECOMMENDED TO CONTROL RED MITE

What can apple growers do about those destructive red spider mites? While DDT has been doing an excellent job of controlling codling moth, it apparently has little or no value in the control of mites. These pests cause serious damage on apples particularly, and control measures are a necessity in a well planned spray program. Dow has long been a pioneer in red mite control research and, as a result, has developed DN-111—a dinitro material that gives excellent control of red spider mites when used alone, with DDT or with many other spray materials.

### PHENOTHIAZINE, AN ANTHELMENTIC, AS AID TO ANIMAL HEALTH

Chemistry is making real progress in developing more effective animal medicines to reduce losses from disease and parasites. Animals must be kept healthy to make money. Farmers, stockmen, veterinarians and pharmaceutical manufacturers of veterinary remedies are showing keen interest in Phenothiazine. This is a de-wormer developed by Dow for sheep, cattle, pigs and poultry, and results obtained in its widespread use have been excellent. Phenothiazine is one of several Dow products developed to promote animal health. Consult your veterinarian, county agent or state experiment station.


DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

*50th Anniversary 1897-1947*

# IT'S HERE

**THE FINEST MILKER IN OUR 33 YEARS OF SERVING THE DAIRY INDUSTRY**

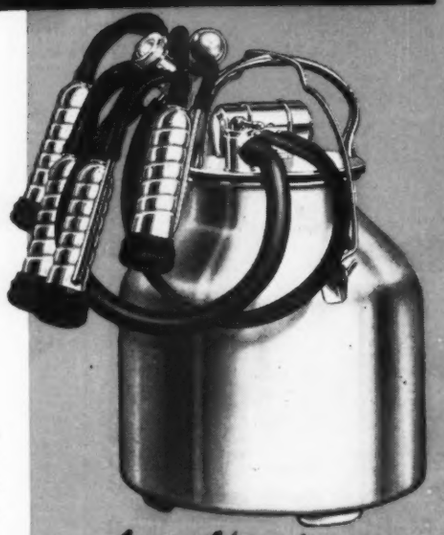
THE NEW DE LUXE

*Perfection*

**MILK-MASTER**

*with*

VARI-MATIC MILKING



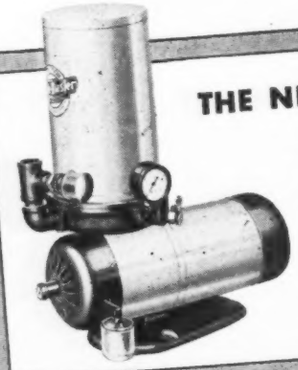
Here's everything you've wanted in a milking machine . . . fast milking, easy operation, and a degree of milking comfort possible only with Vari-Matic Milking. An exclusive Milk-Master feature, the Vari-Matic "mechanical brain" *adjusts vacuum automatically* to the need of each teat . . . enough vacuum for hard milkers . . . decreased vacuum for easy milkers.

Fast milking *alone,* is not enough. It must also be *comfortable* to the cow. The Milk-Master milks quickly . . . but just as important, its fast milking action is made comfortable *to all cows* through Vari-Matic vacuum adjustment. This fast, *comfortable* milking gets more milk . . . makes you more profit.

**PERFECTION MFG. CORPORATION**
**2115 E. Henn. Minneapolis 13, Minn.**

*Way Ahead* **DESIGN**

★ **VARI-MATIC MILKING:** Vacuum adjusted automatically to the need of each teat. ★ **MILKING RHYTHM PULSATOR:** Uniform, soothing action. ★ **WEIGHTED, BALANCED CLAW:** Distributes weight evenly on all quarters. ★ **PULL-MORE INFLATIONS:** Air cushion top gives natural tug and pull action. ★ **EASY-GRIP HANDLE:** Broad, smooth, shaped to fit the hand. ★ **VIS-A-FLOW DOME:** You can see when all the milk has been withdrawn. ★ **SUPER-SIZE MILK PASSAGES:** Full ½" diameter for fast milk flow. ★ **DOUBLE-ACTION MILKING:** Each milking stroke is followed by massage. ★ **RIGID CLAW HOOK-ON:** Teat cups do not bang against pail when carried. ★ **STAINLESS STEEL PAIL:** No seams. Rounded corners. Large opening. ★ **HELIX-RIB TEAT CUP SHELLS:** Stronger, dent-resistant. ★ **GLEAMING-SMOOTH FINISH:** Sanitary, easy-to-clean. ★ **PERMA-SIZE MOLDED RUBBER PARTS.**



**THE NEW *TURBO-FLO* PUMP**

Far advanced in design and performance, the new *Turbo-Flo* is the product of years of development. Quiet, smooth-running, streamlined, compact and completely enclosed. Self-sealing, self-adjusting, floating turbine vanes. Non-pulsating flow, ball bearings throughout. Axial-flow fan cools pump and motor.

**Write for new catalog**

**CLEAN YOUR MILKER *FASTER* with VEL**

ELIMINATES MILKSTONE
LOWERS BACTERIA COUNT
CUTS CLEANING TIME

*Perfection*

**MILK-MASTER**


**DRENCHING**

Sir:

I have bought every issue of your magazine since you started publication. I guess it's okay—and I have enjoyed reading it. I do however take issue with you and your county agents. They may be all right—if they stick to their business, but most of them do not.

If a county agent is a valuable asset to the community, as they wish one to believe, then why doesn't he hang out his shingle and when his services are needed you call him and pay him as you do your doctor, vet, lawyer or dentist? No, its got to come from the taxpayer—75% of which do not even know him.

How many county agents have you known in your time that ever went back to the farm and were successful? Your illustration on pages 16 and 17 is something a county agent has no business to meddle with. Your picture demonstrating the process of worming sheep is dangerous and outmoded. The proper way is by the administration of a stomach tube—which saves time and is much safer. The proper dosage goes where you want it and not down the Treachia or lungs and all over the farm. I wonder if you know just what per cent these boys kill by this old-fashioned method of drenching.

My son is spending six years right now taking a vet course—and when I see such things in print I wonder if we are crazy to take it up so he can render a service to the livestock interest 24 hours a day, at least at night when the county agent is in bed, or the roads so bad he would not get off his rear end to do anything.

Come and see me some time. I'll tell you and show you what a busy Veterinarian has to do, and I'll also show you where the advice of a county agent cost plenty when he can't stick to his business.

A. F. Wempe
Doctor of Veterinary Medicine
Marysville, Kansas

**FREE BACK COPIES FOR VETS**

Sir:

I have shown my copies of the Farm Quarterly to a number of veterinarians in the state, and all have liked it very much and thought it would be something worth having in their office.

As secretary of the Vermont Veterinary Medical Association I am including a list of all the veterinarians in the state of Vermont. I think that a number of these men would appreciate such a periodical if they were acquainted with it. I do not know what your policy is in contacting such men, but if a reprint of an article such as the one on artificial insemination or the more recent one on Bang's disease could be included to show them the type of material which was being published, I am quite sure that they would be very interested in obtaining future numbers of the Farm Quarterly.

E. F. Waller, D. V. M.
Animal Pathologist
The University of Vermont And
State Agricultural College
Burlington, Vermont

**NO POLITICAL MOTIVE**

Sir:

My husband and I were so surprised to see a farm magazine without a *political angle,* and it can be read and understood by anyone.

We are farmers who lived in the city until ten years ago. I have learned a lot about raising chickens from reading E. L. Dakan's article in *The Ohio Farmer.* I have good luck with chickens, although we do not have a nice chicken house. So if you want a good article on chickens, E. L. Dakan can do it. I did not think so much of his letter explaining the angles of a cow's horns, but maybe that is because I do not have a college education.

We raise polled shorthorn beef cattle.

Mrs. C. W. Rothwell
2997 Refugee Road
Columbus 9, Ohio

**E. L. Dakan's first article in Farm Quarterly appeared last summer. — Ed.**

# WINNERS!

Like these Wayne Winners, hundreds of stockmen build show-ring champions year after year the WAYNE WAY. Thousands more, who feed for profit alone, depend on WAYNE for fast, economical gains and market-topping quality. Whether you feed for prizes or profits, it will pay you to study the feeding methods of these winners . . . see what WAYNE "Full Strength" Ingredient Quality Feeds can do for you. Ask your friendly WAYNE Dealer or write us for details, today!

Janet Countryman, Clare, Ill., with her 4-H Club Steer, "Stardust," Reserve Champion Shorthorn in the 4-H Show at the International Livestock Exposition, Chicago, writes: "I fed Stardust the WAYNE WAY, on corn, oats, Wayne Calf Pellets and Wayne Sweet Mix. He did exceptionally well and showed lots of bloom by fair time. I am getting two calves ready for 1947, one a full brother to Stardust. I'm feeding the WAYNE WAY again and hope to do even better."

At the 1946 Indiana State Fair, these Duroc barrows of C. R. Smith & Son, Hartford City, Ind., won the GRAND CHAMPION PEN OVER ALL BREEDS, and at the National Barrow Show, Austin, Minn., they gained a "double-barrelled" victory: (1) GRAND CHAMPION PEN OF DUROCS, and (2) RESERVE GRAND CHAMPION PEN OF LIGHTWEIGHT BARROWS OVER ALL BREEDS!

Another Wayne Winner is nationally-known William F. Renk & Sons, Sun Prairie, Wis. This Champion Shropshire Ewe of the International is just one of many Wayne-Fed winners the Renks showed at Chicago. Others included:
Champion Shropshire Flock,
Champion Shropshire Ram,
Champion Hampshire Flock,
Champion Hampshire Ram
and First Prize Hampshire Ewe.

"Dealer's Choice," a Poland China boar, won the GRAND CHAMPIONSHIP of the 1946 Nebr. State Fair for Wm. W. Whipple of Nebraska City, Nebr. Writes Mr. Whipple: "Our sows get WAYNE Pig & Sow Meal before breeding and right up to weaning. Pigs get Wayne Hog Supplement to Market. On the Wayne Program, our pigs weigh 250 lbs. by 5½ months, and at a feed cost in 1946 of $9.25 per cwt."

Allied Mills, Inc., Ft. Wayne 1, Ind.
Send free feeding information on:

Chickens ☐ Turkeys ☐ Calves ☐
Hogs ☐ Dairy Cows ☐ Beef Cattle ☐

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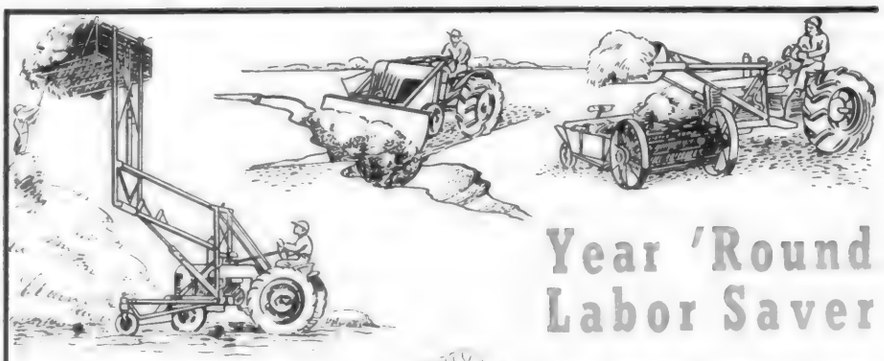
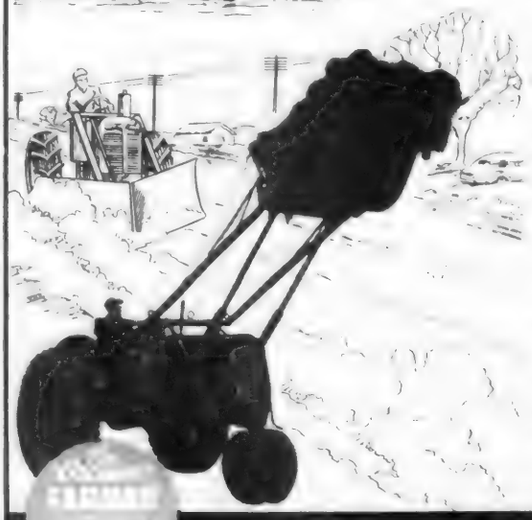
Back of every successful livestock enterprise is a sound feeding program

WAYNE POULTRY AND LIVESTOCK FEEDS



Year 'Round Labor Saver



The "Ottawa" Hydraulic Front End Loader makes your tractor pay its way all year; enables you to get tough two-day jobs out of the way in a few hours. Loads bulk materials, moves heavy objects, stacks hay, scoops grain, plows snow. With an "Ottawa Farmer" and its attachments you save time, money and manpower... Winter, Spring, Summer and Fall. The Ottawa is interchangeable on 27 tractor models. Write for fully illustrated descriptive folder today. Every Ottawa Loader is sold under a money back guarantee.

Ottawa STEEL PRODUCTS, Inc.
OTTAWA, KANSAS • U. S. A.

# ABERDEEN—ANGUS

**ARISTOCRATS OF CATTLEDOM**

Nature made them magnificent at the beginning. Their superiority has remained unchallenged through the centuries. Today the record of invincibility of the beef breed supreme, stands for all to see.

An excellent selection of breeding stock is available from the J Bar C Herd of more than 700 purebred Angus. Sensibly priced . . . guaranteed.

CLARK RANCH

JOHN L. CLARK, OWNER

WARRENTON, VIRGINIA

**SIOUX CITY TWO**

Our compliments to you on the Farm Quarterly. We have just one small complaint: Your story on "Feeder Cattle," page 52, by Roderick Turnbull, implied that Kansas City and Chicago were *the* big feeder cattle markets. Once, maybe, but now it's Kansas City, No. 1; Sioux City, No. 2; and Omaha, No. 3; with Chicago down around 12th or 14th. The USDA acknowledges those rankings but has not yet revised its record-keeping on "stocker and feeder markets" so as to be up-to-date.

Hart Jorgensen
Sioux City Live Stock Exchange
Sioux City 11, Iowa

**AS WE WERE SAYING . . .**

Sir:

An editorial board courageous enough to publish to such an excellent article as the one on artificial insemination which appeared in "The Farm" for summer 1946 should be chagrined to sponsor the illustrations for your article on "The Farm Shop" which appeared in the copy for winter 1946. An outstanding problem on the farm is safety, yet you illustrate on page 96 a farmer using an electric drill which is not grounded properly. The floor is covered with litter. The wiring in the background is illegal and unsafe. On page 100, you show a farmer using a table saw on which there is no blade guard and the saw blade is much too high for the job at hand, there is an unprotected belt, the top of the table is obstructed with some sort of temporary clamp. Note again the faulty wiring illustrated over the work bench. How easy it would be to hang a tool across the live wires exposed at the fuse box. It is no wonder that American farms burn down.

Carl W. Walter, M. D.
Peter Bent Brigham Hospital
721 Huntington Avenue
Boston 15, Massachusetts

**WOODEN BUCKETS**

Sir:

A great number of people have looked at my Farm Quarterlies and have all remarked as to their excellence, however, being a Vermonter, a grave question was raised by your article on maple syrup concerning the use of wooden buckets in Vermont. It is the belief of many of us that it would take a great many miles of travel to even find one wooden bucket used in Vermont.

Francis A. Bolles
State of Vermont
Legislative Reference Bureau
Montpelier, Vermont

**Mrs. Margaret Christowe of West Dover, Vermont, author of "Green Mountain Sap" wrote us March 22:**

**"In the next three weeks if Mr. Bolles will drive north on U. S. Highway 8, starting in my village of West Dover in his own state of Vermont, he will see plenty of wooden buckets hanging to the trees. Driving home from the Post Office today I saw not one but hundreds. For every galvanized bucket were hung two wooden ones. But Mr. Bolles is right, too. We Vermonters do use galvanized buckets, lots of 'em. Our older farmers like the wooden ones, 'heired' from their grandfathers. They say sap doesn't sour in them so quickly. But the young folk prefer the galvanized. They're lighter and easier to handle.**

**"However an error crept into my article. (Page 39, 3rd Col.) You'd get darned little sap out of an acre of sugar bush if it was planted to 1200 trees. An acre supports about fifty trees. Perhaps you meant to set 1200 trees and then cull or transplant them.**

**YANKEE FARMER**

Sir:

In your Autumn, 1946, issue appeared a story on Yankee Farmers. The farm buildings pictured on page 89 were mis-captioned. They are the buildings of the Lee Farm at East St. Johnsbury, Vermont. I helped your photographer select the site.

Thos. H. Blow
County Agent
St. Johnsbury, Vt.

# WATCH FOR IT!

Some day soon your John Deere dealer will show you the Model "M", the new tractor John Deere has designed to provide complete power on farms up to 100 acres and supplementary power on the larger farms. It is powered to handle a 1- or 2-bottom plow, a 6-foot double-action disk harrow, or a 7-foot power mower. It cultivates one row in corn, cotton, and similar wide-spaced crops, up to six rows in vegetables.

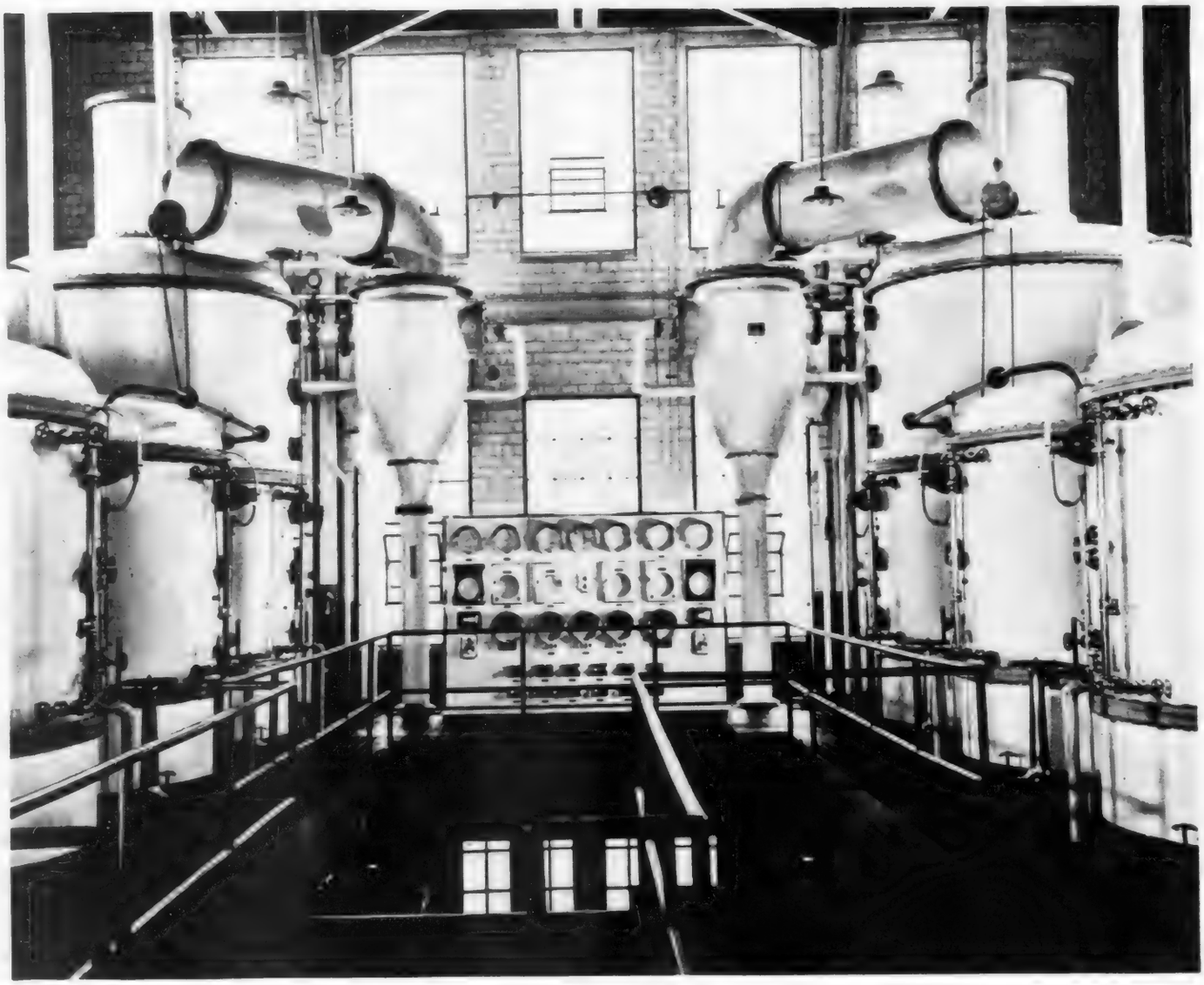
There is so much that is new about this modern tractor and its equipment, you will have to *see* it, and *drive* it, to appreciate why it will put your farm work on a new high level of speed, ease, and efficiency. In its amazing power for its weight . . . in its ease of handling . . . in its comfort for the operator . . . and its new ease of attaching and detaching integral working equipment . . . in all these things, it sets new standards for tractors in its class.

It is a tractor that will free thousands of small-farm owners from the drudgery of horse or mule operation, a tractor with advanced features developed during the war years . . . "Touch-o-matic" precision hydraulic control of the full line of "Quik-Tatch" equipment . . . airplane-type hood fasteners . . . plus a great many other mechanical developments that you will like.

Best of all, the Model "M" offers you every basic feature of John Deere construction . . . simple 2-cylinder engine design . . . thermo-siphon cooling . . . four speeds forward . . . ease of servicing . . . and dependable, low-cost performance. Power take-off and self-starter are regular equipment. Lights and belt pulley will be available if you want them.

Get full particulars. Write today to John Deere, Moline, Illinois, Dept. M54 for free literature.

**A Complete System of Farming for the Smaller Farm . . . Ideal Helper on Large Farms**



# Automatic Kitchen for Farm Animals

Through these evaporators pass some of the most nutritious stock feeds in the world. The panel in the middle makes certain that the process is rigidly controlled, so that the maximum quantity of proteins, vitamins and minerals goes to your livestock. The whole gleaming, efficient kitchen produces the syrup which is the source of Seagram's Solubles.

The dealcoholized grain from which only the starch has been removed is screened and the rich liquid is run through these evaporating units, emerging as a golden syrup. The syrup is then dried and rolled into a fragrant, toasted sheet which is broken up and sent out to farmers as feed supplement. The value of this produce has been proved in many successful feed formulas, particularly for cattle, poultry, and swine.

Seagram research assures that its agricultural products are the finest in the world and that its equipment, like the great "Kitchen for Farm Animals" pictured above, is the last word in scientific achievement.

**Seagram**

GRAIN PRODUCTS DIVISION

JOSEPH E. SEAGRAM & SONS, INC., BOX 240, LOUISVILLE 1, KY.

# All-Crop Harvester: SOIL BUILDER!

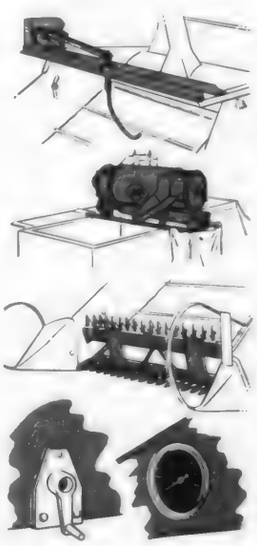
ALTA FESCUE is a crop you are likely to hear more about in the months to come. This tall, highly nutritious grass, seeded with legumes, could double the production of native pastures in the U. S. — *if* sufficient seed were available.

That *"if"* is not insurmountable. Here, with only a 12-year-old lad as his crew, C. W. Savage demonstrates how he harvested $9,720 worth of alta fescue seed from 108 acres the past season.

Once over with the All-Crop Harvester . . . that's all. Proper seed attachments are easily adjusted. The wide, spiral-bar cylinder is tuned like a radio, merely by turning a small crank.

Grasses like alta fescue can rebuild tired, over-grazed pastures, and simultaneously bring you a handsome cash return for the seed. Grains, yes. And soil-building seed crops, too. The All-Crop Harvester handles them all . . . over 100 different crops.

## ATTACHMENTS FOR OVER 100 CROPS



**WINDROW SPREADER**
Spreads windrow over full 5-foot width of the rubber-faced, spiral bar cylinder. Evens feeding.

**SCOUR KLEEN**
Removes weed seeds and dockage — deposits it in a separate bag.

**VERTICAL CUTTER BAR**
Tops sorghum bundles — ends the tedious work of hand topping with a knife.

**HANDY TACHOMETER**
Quick Speed-Changer crank (standard equipment) "tunes" the cylinder speed as easily as dialing your radio. Tachometer (attachment) indicates proper speed at a glance.

**OTHER INEXPENSIVE ATTACHMENTS INCLUDE:**
straw spreader, bagging platform, rotary and draper windrow pickup attachments, flax rollers, dual wheels, tandem wheels, six-bat reel, special sieves and sickle guards, auxiliary motor.

**ALLIS-CHALMERS**
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

# Mile of Farms

RESEARCH AND PHOTOGRAPHS BY JOE MUNROE

THIS is the story of a Mile of Farms and how each farm along the Mile became the portrait of its owner. Around the Mile, like the chocolate covering on a bonbon, is a ring of muck land, soggy, black and very fertile. The ring barely touches some farms: on others it widens out and pushes fingers of reeds and swamp grasses into the clay loam fields, sometimes to the very dooryards.

Since the beginning, muck land has been the measuring stick of the spirit and character of the farmers along the Mile. To some it was an adversity, a sorry thing to be fenced off and forgotten: to others it demanded too much backbreaking labor for its reclamation: some farmers ignored it entirely, content that it remain the haunt of the bull frog and the heron.

(Continued on page 16)

(Continued from page 15)

There was one who saw in the heavy black muck an opportunity. Draining and clearing his portion of the swamp, he found a crop that liked muck soil, and by trial and error learned how best to plant and cultivate it. A reluctant nature, conquered at last by man's will, poured bountiful harvests into his granaries and barns.

The variable in farming is not the soil, but the farmer. For the soil has been there always, watered by the same rains, warmed by the same sun. Until the white man came to this Mile of Farms a little more than one hundred years ago, the soil had not changed in a thousand years.

### Ike Fulton Goes West

Michigan, the scene of this Mile of Farms, was off the beaten path of the pioneer. Long after Ohio, Indiana and Illinois boasted of thriving communities, Michigan, Wisconsin and Minnesota were populated mostly by hunters and trappers. It was not until the 1830's that homesteaders from New York began to trickle in. The first on the Mile was Isaac Fulton.

Isaac tied the coop of chickens on the tail gate, helped his wife to the seat, and whipped his team out of his Wayne County, New York, barnyard. In his pocket was a deed to 80 acres of Michigan land, signed August 16, 1837, in the bold hand of Martin Van Buren, President of the United States.

A tracing of the wilderness "road" was sketched roughly on an old government map tucked into a leather pocket nailed to the wagon seat. Most of it was unmarked; Isaac would inquire along the way.

Somewhere in the wilderness of Michigan, roughly sixty miles north and west of the old city of Detroit, lay Isaac Fulton's eighty acres, on this seventeenth day of August, 1837. Around Isaac's wilderness farm lay other acres, stretching in a procession of woods and swamps and gently rolling meadow to the horizon.

Dancing in the heat of this early fall afternoon, a faint game trail, sometimes followed by trappers and Indians on their way to Detroit, was the only indication that the peace and quiet of a primitive wilderness had ever been broken by man.

In the August evening, as in all other evenings since time had begun, a few deer emerged timidly from the forest to explore the meadows, and a bear, roused from his bed of leaves, dug sleepily for grubs around an old fallen tree.

Although Isaac Fulton bought his eighty acres sight-unseen he fared better than most people who buy a pig in a poke. The rank grasses of the meadows covered a clay loam soil enriched by centuries of decaying vegetation. In the wet weather lakes, which in summer became bogs, rank grasses and reeds decomposed to form a thick, black muck of marvelous fertility.

The nights were already cool and crisp and the oaks and maples wore their first autumn color when Isaac's wagon creaked along the last mile of his journey from the east. He found the surveyor's stakes marking his parcel of land, unhitched his tired team and turned them out to graze. The sound of his ax, as he cut wood for the evening fire, echoed from the wall of trees across the wild grass meadow. A mile away a doe and her half grown fawn raced deeper into the forest and a crow flew up from her roost in a dead oak.

After Isaac Fulton cut logs for his home another family moved into the Mile, and before a year's end seven homesteads were taken up. Skirting the bogs and following the high ground, neighbor visited neighbor, and the paths they made from cabin to cabin became a road. The patches of woods receeded, the cleared fields were plowed, and the green and yellow and brown crops, sharply confined by the geometrical pattern of rail fences, changed the face of the Mile.

In the first months of that first year the seven farms were as alike as seven peas in a pod. Pioneers are neighborly people—they had to be—and they helped each other out. For a time the inefficient, the slow, and the lazy were carried along by their more resourceful and energetic neighbors. Soon, however, as the communal spirit gave way to individual enterprise, the slow horses dropped back, the fast ones edged closer to the rail, and pulled ahead. There wasn't a nickel's worth of difference in the soil on the seven farms, and the sun and the rain fell on all alike. But somehow, when the harvests came there were full granaries and a groaning board on some farms, on others there were gaunt animals and empty pantries.

MUCK is a common problem, for it requires the cooperation of owners in planning ditches and tile lines. Orval Proud, Ray Smith and Dr. Wadley meet at the line fence to plan the drainage of muck which sprawls across their properties.

→

DR. WADLEY'S new $20,000 cattle barn. The money for it came out of his professional income, but he expects it to pay for itself. The floor is made of wood blocks set in asphalt. Here he will show his purebred Angus stock. Improvements such as this, made by the city owners of farms, set the pace for a community and boost the values of all property in the neighborhood.

THE CERTAINTY of Death and Taxes has made a philosopher out of Stanley Smith. He "banks" a bin of wheat for his taxes and keeps an alert eye on the pleasures of farm life. "A lot of folks burn themselves out doing useless work," he says. "Me, I go hunting when I want to. . . . The work is there when I get back."

During the hundred years since Isaac Fulton staked out his cabin, fortune has ebbed and flowed along the Mile. Some failed, and their fields were gobbled up by affluent neighbors. The big farms grew bigger, fattening on the poor ones. Then a new generation came, and the big ones broke up and their parts went back home.

Today there are still seven farms on the Mile. Some are good, some worn out; some are big, some small. Each of a succession of owners left his mark on the fields and the farm buildings.

In the summer of 1947, the seven farmers on the Mile are a reasonable facsimile of all others who have gone before. And curiously, it is the way they handle their muck land, that letters out the differences among them.

### Stan Smith, the Philosopher

Take the first farm—the old Isaac Fulton place. Stanley Smith lives there now. Stanley, 49, is the philosopher on the Mile. A sanguine, friendly man, he has reduced farming to a sort of productive pastime. His 235 acres gross him about $5,000 a year, a little more than half what he could get off the fertile fields if he pushed himself. "I think a lot of folks die young," he says, "because they go too fast and want too much. I don't work on Sundays or after five o'clock."

Stan Smith has climbed above the tyranny of farm drudgery. He'll leave his tractor standing in the field when a cock pheasant sounds off at the edge of the woods. He arranges his stock program so that he can go north during the deer season. Farming to him is a way to enjoy life. He tried embalming when he was young; graduated from a mortician's school and practiced for a while, but he didn't like it. He likes security as much as any man, but he likes freedom too, and he uses his head.

His main interest is sheep, which of all livestock, he says, takes the least care. He's discovered that he can buy bred ewes in fleece in the spring for about $1.50 more than he'd have to pay in the fall. He figures that at a dollar and a half a head for the feed and work in wintering them he's ahead. "A lot of farmers don't put any value on their time during the winter," he says. "I do. I can take my six dogs and go hunting any time I want."

Stanley remembers too well a local bank which failed in '33. Ever since he's "banked" a bin of wheat for his taxes. He has 12 head of Holsteins but takes only enough milk for family use. The rest goes to the calves. He keeps up with new things in farming by watching what is going on at the state experiment station in Lansing. He's interested in brome-alfalfa pastures just now. "Hogs? No hogs," he says, "They're too much work."

Stan's wife and five children live in Lansing most of the time because the schools are better. Stan's wife is the granddaughter of old Eliphalet "Life" Williams, a power along the Mile in the early days.

"Life" bought this farm from Isaac Fulton. There's quite a stretch of muck on the back end of the place, 15 or 20 acres, but it just lays there today as it did in 1837 when Isaac staked it out. "I could make a lot of money out of that muck if I wanted to break my back draining it," says Stanley. "I get along good without it; why bother?"

### Len Cole, the Elder

Stanley Smith's next-door neighbor, leathery, irascible, Leonard Cole, is the senior member on the Mile. Len is 74 and his wife is 66. They have a married daughter, away from home. Len is running out a streak of hard luck, and his farm shows it. Several years ago he was standing in the door of his barn watching a thunderstorm when a bolt of lightening struck the barn, ran down a rafter, jumped through Len. It would have killed a less rugged man, but Len got off with a lame leg. Then a little later he drove to town in his Doodlebug, left it parked outside the grocery. Small boys monkeyed with it and when he cranked it, it ran over him. "It crushed Len all up," said Mrs. Cole. "Broke three ribs and whatall." Then to top it all, he had a stroke nine years ago. Four years ago he started renting his fields and things have been going downhill since.

He has 90 acres, 60 of which he rents out with poor-to-bad return. What with old age and the troubles he's had with lightning and his Doodlebug, he can't do a very good job on the thirty acres he saves for himself. His renter failed to get the corn cultivated last year and the "catch" wasn't good. He says his income last year grossed around $1,500, the biggest item being milk and cream from his three Guernseys. He feeds out a few hogs, has 28 Shropshire ewes, 9 lambs.

His farming is a mixture of present day methods and "the way grandfather did it is good enough for me." He practices a sound rotation, sod, oats, corn and sod again, and he believes 2-12-6 fertilizer is the best a man can put into the ground and he uses it on every crop. He doesn't believe in lime. "Makes the ground hard," he says.

He has 8 acres of muck on his place which he regards as an affliction, somewhat the same as his game leg. "Before I got my Doodlebug my team used to get bogged down regularly in the muck. I'm too old to do anything with it and sure as hell nobody wants to rent it."

One of the reasons why Len Cole's place looks like a page out of *Grapes of Wrath* is the Wadley farm across the road. Dr. Ralph Wadley, who lives in East Lansing, could easily spend $20,000 for a new stock barn and buy one of the best bulls at the International out of his income as a surgeon. He has no intention of doing that, except as a temporary "loan" to the farm, for he regards Raona as a paying investment rather than a hobby.

A HEAVYWEIGHT sugar beet grown on the Miller muck and sized by the family cat. One third of the man hours on the Miller farm went into sugar beet production.

### Dr. Wadley, the City Farmer

Doc Wadley is the adventurer on the Mile. He's a big fellow, energetic, re-

LEN COLE, struck by lightning and run down by his Doodlebug, feeds out a few hogs and scratches around on a part of his farm. There comes a time when a man loses interest in a lot of things that would have bothered him when he was young, the creaking windmill, the sagging porch, the unpainted siding. A man, when he is crippled and old, can do just so much.

**JOHN MILLER has the solution of the farm labor problem—grow two husky sons and make farm life interesting enough to keep them from wandering off to the city. Sugar beet farming requires expensive machinery, plenty of man hours in season.**

sourceful, and generous. He was born and raised on a farm not far away. Twenty years ago, when he wanted to buy a farm home for his parents, he thought of the old Williams farm, which, he remembered as a kid, was one of the best anywhere—neat buildings, bulging granaries, and fertile fields. When he went back to buy it he was shocked at its run-down soil, its ramshackle buildings, and decrepit fences. But he bought it anyway—paid a high $12,000 for 200 acres. He's bought up around him since and now has 756 acres.

For a while his father managed the place and it did well. Ten years ago he died and Doc Wadley tried the farm manager system. Then his troubles began. "It's a wonder I didn't sour on farming," he says. "After one fellow left I was a year picking up the empty beer bottles around the place. The next man I hired sold most of my purebred Berkshire sows before I caught him. I asked his wife, 'What shall I do with your husband?' and she said 'I'd fire him.' I thought that a good idea so I fired him. I was about ready to give up when I got Ray Smith."

Smart young Ray Smith changed the

## THE SEVEN FARMERS ON THE MILE AND THEIR SEVERAL MONEYS, ANIMALS AND ACRES

| Farm Owner | Acres | Gross Income | Cattle | Hogs | Other Stock | New Value Machinery | Gross Income Per Acre | Education | Persons Living on Farm |
|---|---|---|---|---|---|---|---|---|---|
| STANLEY SMITH, 49<br>He's a philosopher. | 235 | $5,000 | 12 | 0 | 50 chickens<br>200 sheep | $6,075 | $21. | High school<br>2 yrs. embalming school | 4 |
| DR. RALPH WADLEY, 46<br>The well-to-do city doctor. | 756 | $42,000 | 240 | 30 | 3 work horses | $23,975 | $56. | High school<br>Med. school | 23<br>(1) |
| LEONARD COLE, 74<br>Too old to do much work. | 90<br>(60 rented) | $1,500 | 3 | 10 | 37 sheep | $2,150 | $17. | High school | 2 |
| ORVAL PROUD, 47<br>He's a hustler. | 240 | $9,000 | 72 | 12 | | $11,175 | $37.50 | 7th grade | 11 |
| LAWRENCE LOCKE, 35<br>Works in town. | 118 | $1,800 | 7 | 3 | 250 chickens | $2,800 | $15. | High school | 4 |
| DR. E. M. JOSLIN, 58<br>A retired veterinarian. | 40 | (2) | 4 | 25 | 50 chickens | $5,275 | | High school<br>Vet. College | 4 |
| JOHN MILLER, 49<br>Smart and has 2 husky sons. | 227 | $22,000 | 8 | | 35 sheep<br>400 chickens | $12,500<br>(3) | $97. | 9th grade | 6 |

1. Does not include Dr. and Mrs. Wadley who live in East Lansing. 2. Joslin claims farm has no income. 3. Also own mint still, $4,000.

picture. Operating his own farm before Doc Wadley hired him, Smith is clever, reads a lot, keeps up on all the new ways of doing things, and he likes fine cattle and knows how to fit them to get the best prices.

"My advice to the city man who wants to own a farm is to find the manager first and then buy the farm," says Dr. Wadley. "When you find a man like Ray, make him your partner. When Ray came here we had the same machinery, the same stock, the same fields. Cattle we used to get $200 to $300 for we now get $900 to $1,000 on the same price scale. Since he has been here we have raised the acre average of our oats crop from 50 to 80 bushels and we've put a lot of land into high production by laying 16 miles of drain tile."

Doc Wadley has won the respect of the good farmers along the Mile. "A city man owning a farm is usually confronted with a subtle feeling among his neighbors that he's spending money they can't," he says. "They think he's not practical and they lose respect for him. I try to be practical." His practical approach to farming comes out in his soil building program and in his efforts to raise the quality of livestock in his community. He had a complete soil analysis made by the state university people and has followed their recommendations. He limed the whole farm—three tons to the acre; he uses the enormous quantities of manure produced by the 240 cattle on the place, and applies 800 pounds per acre of 0-20-20 on all seedings. He raises all his own feed except concentrates and nothing goes off the farm except on four feet.

He recently completed a $20,000 stock barn for showing his sale cattle, using a new idea, wood blocks set in asphalt for floors. Last year the farm operated at a book loss in spite of $42,000 in stock sold off the place. "As soon as we complete our plan of improvement the place will be geared for profit," he said. "We're looking ten years ahead."

"I get a kick out of making money," he said, "but I get a bigger kick out of selling a good bull to a farmer who is interested in bettering his herd. I would like to see all the scrub bulls around here sent to the sausage factory."

His Angus herd, according to the Association, is one of the best in the country. He has enough show ribbons to make a tent.

He approaches the 75 acres of muck land on his place with the same practical point of view he has approached the run-down soil problem. "Orval Proud and I have a common problem in our muck," he said. "Our muck adjoins and we have recently got an engineer in there and have worked out a way to drain it and put in onions or beets. We couldn't do the work alone because it's really one piece. We had no trouble in getting together. We'll have that muck in the

WHAT BETTER PLACE for a political argument than the township house on election day. Orval Proud, right, and his father-in-law, left, air a difference of opinion on candidates. Joe Spears, the supervisor, drops their ballots into the can.

ORVAL PROUD (right), hired man Vance Mead, and his Jerseys. Proud runs his farm and dairy with a production line efficiency and turns out a surprising amount of work on time. Mead runs the milk route and pinch hits as a farm hand.

RAY SMITH, Dr. Wadley's partner and tenant, excels at fitting stock for show and sale. Dr. Wadley watches Smith trim the feet of a bull trussed up in a home-made rack.

profit column as soon as labor shortages ease up."

**Orval Proud, the Dairy Man**

Orval Proud, Raona's neighbor, is a farmer's farmer. He operates his own 240 acres and 120 acres of rented land like a factory. He's the dairyman on the Mile, keeps 40 of his 72 head of Jerseys on the milking line. Ask anyone on the Mile and they'll tell you that Orval does the best job with his fields and his stock. A husky, pleasant ball of fire, he looks more like a business executive than a farmer. How Orval, with two helpers, farms 360 acres and takes care of a 70-head dairy herd and still has time to eat and sleep is regarded as a mystery on the Mile. It's no mystery to Orval—it's production line efficiency. "Farming nowadays has got to be a business," he says. "I learned that from my father. There was 14 children in my family and each one had a job to do. We got a whale of a lot of work done."

A PART-TIME farmer, Lawrence Locke works in a shop in town and keeps a few laying hens. He rents his fields against the time he can buy his own machinery and stock.

"When I say 12:00 o'clock is lunch time, 12:00 o'clock it is, not 12:01. We work like hell but we eat on time, quit on time, and the barn is dark and the milking done at 8:00."

The Proud farm is completely mechanized, another reason why three men can farm 360 acres and run a dairy. Orval has no patience with farmers who gripe about not being able to "do their little dab of work." "Sometimes I get ashamed at the way some farmers run their farms —ashamed at being a farmer."

He raises everything that goes into his cow feed except minerals and yeast. He figured out that if yeast is good for humans it's good for stock, so he started mixing 2 lbs. of yeast with every 100 lbs. of feed. Yeast, he says, brings out the best in corn and oats. He keeps his calves in the barn the year around and feeds them grain and the yeast.

He's willing to experiment and try out new crops and ways of getting work done. He tried a brome-alfalfa-clover mixture but it didn't do well and he went back to straight alfalfa. He tried Sudan grass for pasture and likes it. Proud doesn't have much truck with government agencies but it's not because he isn't progressive. He'll try anything new that promises to better his crops; limes often, uses a lot of manure and fertilizer. He had an unsatisfactory experience with a county agent that soured him. "When I first started

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THE ONLY SOCIAL TIE between the families on the Mile comes second-hand through the children who attend the white school. Here Margaret Suttell mothers, scolds, and instructs twenty-three youngsters in eight grades. Miss Suttell once wanted to be a barnstorming aviatrix. Country schools turn out better pupils than city schools, she says, because kids get more personal attention.

Dick
Jane Dick
Jane Dick
She
What
no Mother
Yes Guess Will
7 8 9 0
What yes
she

DOGS ARE LIKE CHILDREN. Both respond to intelligent teaching and affection. To train a Border Collie or any other kind of a working dog to bring up sheep in a tight group like this requires a good many hours of patient work; when it's done you have a smart, hard-working helper whose one great desire is to please you.

# WORKING DOGS

## Make an Extra Hired Hand Out of a Border Collie

By DON S. BELL

MOST OF US who grew up on a farm have wonderful memories of an old Collie dog called "Shep." He had an uncanny, inborn ability to handle sheep and cattle. Shep was a broad-headed, short-nosed dog with a sharp eye, a keen ear, and a shaggy black coat touched with a bit of white and tan.

Shep was capable and accomplished, a constant companion and dependable friend, a guardian with a deep sense of propriety; he performed all of the livestock chores faithfully. It didn't make any difference to Shep whether he was asked to fetch the cows, herd the sheep, bring up the horses, put the old sow back under the fence, or simply chase the chickens out of the yard or garden. He seemed to understand everything he was told to do; and he did his work with the zest of a trouper playing before a packed house.

Somehow, about half a century ago, the old Sheps seemed to disappear. People say that through careless breeding the old dog and his talents were dissipated and lost to posterity. As young folks listen to the tales of the old timers they often make it plain, with a wink, that they think his mind has slipped a bit, that the passing of the years has created a halo for a canine creature which could never have existed.

Old Shep was real; the old timer's stories of his accomplishments are not dreams. If you don't know his story, listen!

The name "Shep", of course, identifies his clan. This name came logically by right of his relationship to one of the oldest and most illustrious family trees in dogdom; it is a password for working dogs and links him with the dogs of the shepherds of the world.

### The Roman Shep Was A Fighter

Back 2000 years ago, the shepherd's dog was a large, ferocious beast used principally as a fighting guard for the flock. He was of a size and build which made him capable of meeting a wolf head-on and killing him. He was raised with the flock, and he was trained to circle them at night like a sentinel on watch, alert to every noise and movement which arose within his domain.

The Roman scholar Varro (36 B.C.) tells us that each shepherd dog on duty was fitted with a *melium*. This was a broad, stiff-leather collar studded with nails. Underneath the nail-heads was sewed a piece of soft leather to prevent the hard iron from injuring the neck. In a battle between dog and wolf, the wolf, in grabbing for the dog's throat, found he had bitten off more than he could chew. Present day spike collars for fancy pooches are like the soldier's brass buttons, they stem from a functional use in antiquity. But today they only serve as an ornament. They set the dog apart from the common mongrel gang in the alley.

Shep came to us from Britain as early as 1800. This, of course, makes his arrival timed to the basis of need. The importa-

**THIS IS THE DREAM DOG that every stockman wants to own. On Sunday when you are in your good clothes he goes down in the pasture and brings up the sheep or the cows, drives them into the barn and does everything except lock the barn door.**

tion of the Merino, Leicester and Cotswold sheep was bringing about improvement and expansion of our own sheep industry. On the newly-opened western grazing areas the herding dog was indispensable.

In the early days Britain provided three types of working dogs for our livestock industry. One mentioned about 1844 was a large, black-and-tan dog with a shaggy coat and heavy build which went under the name of 'English Shepherd."

The second type was a naturally bobtailed dog with a heavy, shaggy coat and a lumbering gait. At the time he was brought into our country he was known as the "Drover's Dog" or the "Butcher's Dog." Like a Judas goat his purpose in life was to take the lambs to the market.

The third type came from Scotland and was called Sheep Dog or Colley. In the 1870's, Randall, in talking of all sheep dogs, wrote under the subject "Scotch Sheep Dog or Colley".

"The light, active, sagacious Colley admits of no superior, scarcely an equal, where it is his business merely to manage his flock and not to defend it from beasts larger than himself. The sagacity of the shepherd's dog is wonderful; and if I had not seen so much myself, I could hardly credit all we read about them."

The history and gradual disappearance of the Colley dog in America, beginning about 1880, was a confusing interlude for farmers and stockmen who used dogs and valued them for the work they could do. Had farmers and stockmen known what was transpiring in dog shows in Britain and America about this time, they would understand what happened to the dogs.

Officially, dog shows are credited as beginning at Newcastle-upon-Tyne, England, in 1859. A class for Collie dogs was included in the official classification for 1860. Up to this time the dogs had been used solely for work and the breed had been kept pure but without written pedigree. Most of the first Collie entries were provided by the farmers and shepherds of Britain. They played briefly with the idea that perhaps their dog could be a show dog and a working dog, too. It was only a few short years, however, until they concluded that they could not breed a dog for show points and still have a dog that would get the work done. The farmers and shepherds forsook the show game, took their crooks in hand, whistled for the Collies, and went back to the hills and their flocks. In the interim, however, dog fanciers had taken up with the Collie dog. The old work dog had gone into the show

game under the guidance of the dog fancier.

### The Royal Smile

When Queen Victoria first saw the rough-coated Collie she took an instant liking to the breed. The royal pat on the head was a golden touch for the Collie with the British dog fanciers. It was the American fancier, however, a few years later, with his eagerness and his fat pocketbook, who really set things on fire in the show Collie business. Between 1880 and 1900 many high-priced show dogs were imported, and these received wide publicity. However, those in the pastoral profession never turned over to the dog fancier the right to breed and classify the Scotch Collie under a bench definition which, as it now stands, involves 847 words setting forth what the dog shall look like, and not one word as to what the dog shall do. Here was a Gilbert and Sullivan "most unusual paradox". The fanciers had tinkered with the Collies until they had good looks, long noses and aristocratic manners, in fact everything except the one thing expected of them, working ability. Farmers who knew nothing of what was going on were generally confused. The shepherds, caring little or nothing about the whole tangle, continued to breed their Collie dogs as they always had, on the basis of use and service.

Then some of the shepherds decided it was time to have a test of the intelligence and working ability of *their kind* of Collies. It was at Gart Coch, about a mile from Bala, Wales, in October 1873, that shepherds met for the first time to put their working Collie dogs, and other sheep dogs, into a field trial test to determine individual superiority among the competing animals. This was the official beginning of the Sheep Dog Trials. The first trial's winner was a small black-and-tan Collie bred from Highland parents and owned and run by a Mr. James Thomson, a Scotsman from Dumfriesshire.

The trial's movement was introduced into America in September, 1880, at Philadelphia, Pa., but any benefit which might have resulted was lost because of the confusing interlude with the Show Collie family. Sheep Dog Trials were not reintroduced until the 1920's.

### Modern Dog Trials

The re-introduction of the Shepherd's Working Collie has been on a sound performance basis and with the dog in its improved form. The trial-bred, well-trained Sheep Collie or "Border" Collie, so named because outstanding dogs have come from the pastoral region between England and Scotland, dazzles spectators with its brilliance. The dogs are phenomenal, as anyone who has witnessed their performance will admit. Most farmers long for one of these dogs to do the chores. Without much knowledge of training, or how to go about it, they are reluctant to undertake the job.

Everyone has heard the wit's remark, "In order to train a dog, one must know more than the dog". Actually, to train a sedate working dog, one need only know his pupil, know something about the qualities which have been bred into the dog and how the dog is likely to manifest its inherent instincts. A few things are basic. One must start with the full knowledge that a sheep dog must be bred for its task.

There is no secret method used for training a well-bred dog. Anyone who really sets himself to the job can do it. Training, after all, is simply the art of educating a Sheep Dog to use its talents properly for the benefit of the owner. If the farmer has a reasonable degree of success with the first dog, it is a dollar to a doughnut that he will never be without the services of a good dog for as many years as he may be in the livestock business.

UP TO SIX MONTHS of age a puppy need not be trained to do anything but come when he is called. The theory is to wait until he is old enough to do a little thinking and strong enough to do some work. The "check cord" shown in use here is for rebels who don't come promptly when called. A gentle tug accompanies the command.

### How To Buy A Working Dog

Suppose we take a look into a few rudiments of the job of selecting and training

**SHEEP DOG TRIALS are the working dog's show. The trial is on an official course as shown in this photograph. The first part of the work is the "gather", which consists of going out on a line given him by his master, to the sheep which have been placed at the far end of the pasture. Upon sighting the sheep the dog swings around them at full speed. He comes to a stop and introduces himself to the sheep in a firm and friendly manner. Then he "lifts" them and brings them in a straight-line "fetch", driving them through the left gate first, then across and through the right gate. The handler then opens the gate to the small pen and the dog must complete the job of putting them in, without any help but his master's commands, and moral support.**

a working dog. Be certain to get one of the very best breeding possible. The $35.00 to $100.00 he costs is not too much when you consider he may save you or your hired man one to two hundred dollars a year in time. Whether one obtains a male or a female is a personal choice. Personally, I think it is a waste of time to bother with a dog that does not come from proven working parents. Just because someone tells you that he offers Border Collies doesn't prove that he is offering stock from trial-bred Border Collie parents. As a buyer, and for your own protection, insist that a Certificate of Registration in the Stud Book of North American Sheep Dog Society, or the parent Society, the International Sheep Dog Society of Britain, be furnished with the dog. Such a certificate assures you that the puppy derives from parent stock which met the requirements for registration in their native home-land of Britain, and that the sire and dam have proved their ability and thus are recognized as dogs fit to perpetuate the qualities of their kind. You, also, won't be able to register progeny of the puppy you buy until your dog proves its ability according to the Society's requirements.

Why start with a puppy? Simply because the two pupils are going to tackle the problem together. They will grow up together and should understand each other from the start.

There are a number of breeders of Border Collies who advertise in the sheep magazines. If you don't see these, the office of the North American Sheep Dog Society at Wooster, Ohio can supply you with a list of reliable breeders.

Assuming that you have found the puppy of your choice, when the Express Agent calls to say "I have a dog for you", don't call the family and all of the neighbors with the expectation of a romp with what you expect to be a bouncing ball of exhuberance, joy and enthusiasm. The puppy will be tired, hungry, thirsty and confused in this new world that has spun around his head, and he will be lonesome from the loss of his mother and his playmates. He may have been a little carsick from his ride. Nothing should be done to confuse him further. Just put him into clean quarters which are to be his home, give him a drink of milk or water; and go away and leave him alone. He will want to see you after a little while, and when you do go back, have a little feed with you, and talk softly to him to give him assurance that everything is going to be all right. If you feed him regularly, he will soon be greeting you enthusiastically; there will be growing all the while that bond of enduring worshipful devotion which is fundamental in all animal training. When the puppy gives you that devotion, never, never do anything to shake his faith in you.

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WHEN THE DAWN is pushing up the blue curtain in the eastern sky and the pasture is dripping wet, a man and his best friend like to stand for a while, and drink in the sounds and smells before starting the day's chores.

THE PENDULOUS udder invites injury. Mastitis has done its dirty work here, dried up the two teats on the west side.

# MASTITIS

By JACK BAILEY

NOT so long ago a cautious individual was dickering with a farmer for a cow. He looked the animal over critically, peered in her mouth, pinched her, examined her udder, and then looked at the farmer suspiciously.

"Does this cow give much milk?" he asked.

"Wall, I wouldn't say she gives a lot of it," hedged the farmer, "but she's a good natured ole gal, and gives every bit she kin."

This cow is like thousands of cows that have mastitis in the United States today. Each giving "every bit she kin", but the handicap of disease is sometimes a pretty severe one. Maybe we have been blowing in the wrong end of the horn these many years by trying to cure the disease instead of trying harder to prevent. Not that cures aren't appreciated, but if more prevention was practiced, less medicine would be needed. Perhaps if we concentrated on causes, we could do a pretty good job of heading off mastitis and wouldn't need be so much concerned about cures. Let's have a look.

The experts say that bacteria of various kinds cause mastitis. We all know that bacteria are responsible for what we call infections. A cut finger may cause the loss of an arm through blood poisoning. A stubbed toe may wind up with the amputation of a leg because of gangrene. The point is, there's always something that makes it possible for the bacteria to start growing. It may be a scratch, a cut, a bruise, or a puncture, but it's always there ahead of infection. In other words, there's a cause before a cause.

Well, mastitis is an infection caused by bacteria, so there must be something to start it off, too. Therefore, we should be able to prevent mastitis by preventing udder injuries. Sounds reasonable, but wait a minute; there is something else.

Poor old bossy already has two strikes on her in regard to infection of the udder. That is because there are natural doors there for bacterial entrance, one in the end of each teat. Maybe if we kept the cow cleaner on the outside, there wouldn't be any bacteria to crash the gates, and get inside. That would be a preventive measure, too.

It's clear, then, that we have two sides to this business: (1) the prevention of udder injuries, and (2) the cleaning up of the cows so as to keep away the bacteria. Seems that the two projects would have to be run together. No injuries plus no bacteria to sneak in the teats should equal no mastitis.

Well, let's see; suppose we make a survey. Let's take a look at the barnyard, the size of the stalls, the bedding, and possible booby traps as factors in mastitis.

What kind of barnyard will contribute the least to the causes of mastitis? Well, the best one is of concrete, but few of us will ever be able to have that kind, so let's settle for any kind that stays half-way dry. Mud is expected in a barnyard, because it's that kind of a place. However, when the owner goes over the third buckle on his galoshes to bring the cows in, there's a possibility that the mud may be getting a bit too deep.

Deep mud is dangerous. Our best cows have big udders, and when they have to drag them along through the most dangerous kind of dirt, we are slipping in our good resolution to keep the cows clean. Not only that, but the dragging is apt to result in scratching and bruising the udders; scratches for bacteria to grow in on the outside, and bruises for them to grow in on the inside. Where ever they are growing, the bacteria are multiplying, increasing the number available to infect other cows. A few loads of sand, a tile line, or even an open ditch may be the means of correcting the trouble.

Most barnyards have low spots where water collects, stagnates and acts as a trap for whatever urine and surface drainage are deposited in it. This becomes a bacteria broth and udders dragged through it suck up disease. Fill such low spots with gravel, and dump spoiled hay there to sop up the excess liquids.

Now about stall size. They may be too long, too short, too narrow, or infrequently, just right. The correct size stall, of course, depends on the occupant. A little looking will tell how the stalls fit the cows.

If the stalls are too long, we come up against this matter of cleanliness again. In such stalls, it is pretty hard to keep the cows from continually lying in filth. That doesn't help to keep bacteria away from the open ends of the teats. If the stalls are too short, the cows stand with their hind feet in the gutter, often bringing the teats down on the dirty platform. If a cow lies down, most of her rump is in the gutter. Her udder is draped over the sharp edge of the platform, with a lot of her weight on top of it. Bruising and contamination may result. If the stalls are too narrow, especially if there are no partitions between the cows, the chances of udder injury are greatly increased. One cow lies down, and her neighbor promptly steps on her udder or teats. Most any farmer can tell you that means trouble.

Who watches all these angles? That rare old bird, the ablest citizen of any country, a good farmer.

Width recommendations of stalls are four feet for Holsteins and large cows; three to six inches less for Guernseys and medium breeds; and three and one-half feet for Jerseys and small cows. When the stalls are too narrow, taking out a stall or two and dividing up the extra room may make all of the others wide enough. Most modern stanchions can be adjusted a few inches forward or backward to remedy the length problem.

That brings us to bedding. It is not particularly a choice of materials, but rather the amount that is used, that counts.

A cow's udder is a delicate piece of machinery. Just as we invite trouble by bruising it, so we ask for it by allowing the udder to become wet and chilled. Then we say, "Number 12 caught cold in her udder." Not that such conditions always cause mastitis, but they certainly often help to cause it.

There are other mastitis booby traps around the average barn. They all depend on udder injuries to make them effective. A common one is a high threshold that makes a cow jump a foot or so to get into the barn. She makes the jump, and—Wham! her udder bangs into the sharp edge of the dirty floor. Not one cow, but all of the heavy uddered animals in the herd have to do it twice a day, every day, during their milking period.

Another common trap is deep gutters. When a cow enters her stall she usually steps over the moat. Coming out, it's different. She is backing up, and can't see where she is going. Down goes a foot into the gutter, and down goes the udder into the dirty edge of the platform to cause bruises.

It is fortunate that these two pitfalls can be easily remedied. A few loads of sand or a concrete ramp at the door will fix the high threshold business. A little concrete poured in the drop will raise the bottom to the right level.

Another potential is the quarrelsome cow. Cows like to fight just the same as people do. Sometimes they caper around just because they are devilish. However, most pugnatious cows become peaceable if their horns are removed. Sure, there will still be udder injuries from fighting, but they won't be so many of the bleeding kind, anyway.

A recommended practice is the removal of horns from week-old heifer calves by the intelligent use of caustic potash. It isn't as serious an operation as dehorning them after they grow up. In the long run, it's a matter of personal choice whether cows have horns or not. A well-polished set of horns may look pretty

A SHORT STALL or a high threshold forces the teats of a heavy-uddered cow into the floor litter and filth.

A BUCKET OF SAND scattered on the slippery floor of the barn may save a valuable cow. Danger spots are at the turns into the stalls and the doorway. Bruises invite mastitis.

THE BACK PART of the stall, where milk is likely to be spilled, makes a good playground for bacteria. An occasional scrubbing with a lye solution will leave the floor clean and sweet. Lime hinders the growth of bacteria, but doesn't kill them.

WHEN THE UDDER drapes itself over the edge of the stall into the gutter after the cow lies down it may be bruised, chilled or stepped on. Adjust the stanchions or lengthen the stall to give plenty of rump room and don't skimp on the bedding.

at the county fair, but a blue ribbon is poor compensation for an attack of mastitis. It is well to remember that horned cows have a better chance of causing mastitis than the bald ones do.

A particularly vicious trap is a smooth, wet floor. Everybody who has worked around a dairy barn knows how hard it is to walk on one. It's just as difficult for a cow to do without her feet flying out from under her. If she does fall, she's pretty apt to bruise her udder by jamming it down into the concrete. Sprinkling the floor with sand or crushed limestone is insurance against accidents.

A miscellaneous group of troublemakers, all of them mechanical, include such things as projecting irons, beams, and nails in places where they are apt to injure udders. It's a good idea to check the premises for them.

That just about winds up the consideration of things around a barn that may cause mastitis even before we start to milk. Now let's examine the actual milking process for potential mastitis traps.

What about irregular milking and incomplete milking? We list them together because they are often associated. These practices do not cause mastitis in healthy udders, or most cows would get the disease when they are being dried off. In udders where bacteria are already present, the story is quite different.

To understand why this is true we have to consider the way bacteria multiply. They do this by splitting; one becomes two, two becomes four, and so on. This means a very rapid increase, especially when splitting may be taking place every fifteen or twenty minutes. The longer bacteria are left in an udder, the more there are to double in numbers.

The speed of milking may directly cause incomplete milking if it is done too slowly. The faster a cow is milked, the more she can help by "letting down" her milk. If milking takes too long, she is often not completely milked, for some of her milk is left in the upper part of the udder. Only the cow can get at that milk to squeeze it out.

Suppose the cow is machine milked. The teat cups may be left on too long to tug at an empty udder. When continued day after day, that kind of thing means a possibility of irritation and injury. Again, it may encourage the cow to become a "stripper", with consequent danger of incomplete milking. There are "hard milkers" and "easy milkers". In any case, the milking should be done as fast as possible for best results in mastitis prevention.

Another factor in milking is changes in routine. This sometimes results in incomplete milking. Cows get used to things being done in a certain order and at a certain time, and changes often upset them so they don't "give down" their milk. For safety's sake, then, a regular schedule should be followed in doing the daily chores.

**THE CHEAPEST INSURANCE against infection is plenty of bedding changed often and kept free of droppings and dampness. Bacteria are discouraged by dryness.**

There is always the possibility of direct udder injury from poor hand milking technique. Some people just don't know how to milk. Not only may the cows be incompletely milked, but udders may be bruised. One of the fastest milkers we ever knew gripped high up in the udder. He was considered an excellent milker, but cows in his "string" were always bothered with mastitis. Hand pressure injured the delicate glands in the udder.

Udder injury may also result from the improper use of milk tubes and teat dilators, which are also dangerous as carrier of bacteria. Kicking or striking a cow in the udder is also a first rate way of causing dangerous injuries.

The matter of sanitation in milking procedures will influence the course of mastitis in a herd. Disease producing bacteria may be on the outside of the teats and udders at milking time. Therefore, it would seem like a good practice to wash them with a chlorine solution of 200-250 parts per million to kill the bacteria before they have a chance to be carried into the ends of the teats by milkers.

**A SECOND after this picture was taken the reclining cow was kicked in the udder. Crowded stalls and loafing pens do this.**

THIS MILKER is committing mayhem. Faulty milking technique will injure the delicate glands at the base of the udder, provide a base of operations for bacteria.

Then, too, there may be bacteria already in the udder, and as a result, being given off in the milk. To get around the possibility of carrying germ-laden milk to the next cow, it is recommended that hands and teat cups be dipped in the chlorine solution after every cow is milked.

A further precaution against carrying infection from cow to cow consists of a definite milking order. A strip cup is a necessary piece of equipment in establishing such an order. We never know when a cow is going to start giving off mastitis organisms in her milk, but a strip cup may help us spot the trouble before it has a chance to spread to other animals. If all the cows are checked at each milking, flakes, clots, and off-color milk will show up and we can do something about it.

With such a system, clean cows may be milked first, then the next cleanest, and so on. The strip cup indicates any change in an animal's status, and she is promptly put in her correct place in the milking line. In other words, the chlorine shouldn't be depended on entirely to prevent the spread of mastitis. There may be a few of the bugs that aren't killed.

Sanitation should include the floor, too, especially the back half of the platform. Milk is spilled there that may contain bacteria. If bacteria aren't present when the milk is spilled, they soon appear, for such a mess makes a fine place for them to start growing. When cows lie with their udder in bacterial settlements, mastitis is a likely result.

A can of lye to three gallons of water makes a very good floor disinfectant. Pushing the bedding forward, and scrubbing the back half of the platform a few times through the winter will kill off a lot of potential trouble. Contrary to popular belief, lime is not a disinfectant. It hinders the growth of bacteria, but doesn't kill them.

It wouldn't be right to leave the subject of milking without a word about improperly adjusted milking machines. They may cause trouble through faulty setting of pulsators, or the use of too much or too little vacuum.

Setting a pulsator at a high rate doesn't mean that the milking is going to be done faster. A teat has to have time to fill up between squeezes, and fast pulsators do not allow enough time for this. At the other extreme are those that run too slow, and do not get the milking done fast enough. In either case, incomplete milking is the result. All manufacturers furnish recommended pulsator rates for their machines. Such recommendations should be carefully followed.

The use of too much vacuum has the effect of drawing out the lining on the ends of the teats. Such an arrangement certainly makes it easier for bacteria to enter the udder.

THE FIRST LAW OF mastitis prevention is cleanliness and a liberal use of the old standbys, chlorine and elbow grease.

**A COW'S UDDER is a highly specialized and delicate mechanism. The tissues are fragile and easily injured, and milk at body temperature is just right for the quick propagation and growth of bacteria. A bruise tears down the tissues, the bacteria find an entry through the teats, and mastitis is on the way. A slippery concrete floor as the cow turned into her stall caused this fall.**

Too little vacuum results in slow and incomplete milking because there isn't enough suction to do the job. It is often due to a partly plugged air line. The vacuum gauge cannot be regarded with blind faith, for it sometimes goes haywire just like everything else. Frequent washing of the air line with a lye solution, and an occasional check by an authorized company agent (they're beginning to come around again) will serve to keep the vacuum on its good behavior.

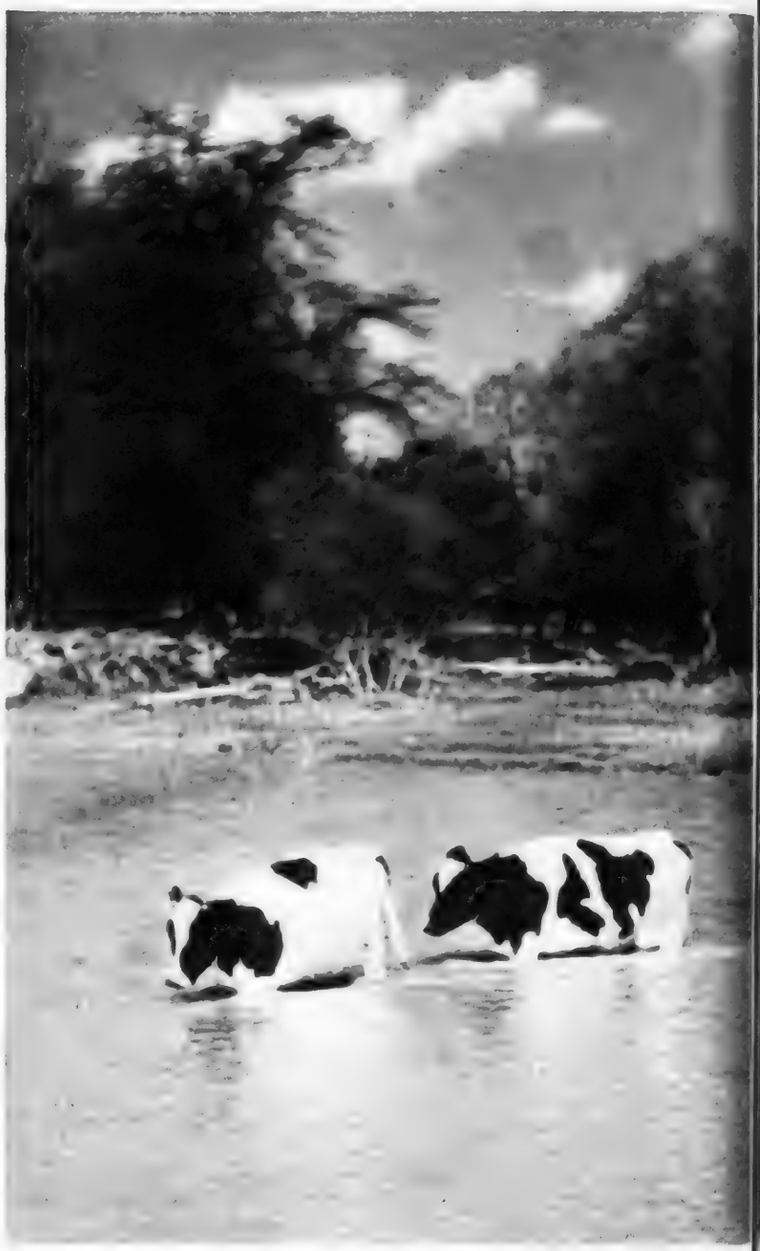
In closing, a word might be said about two other matters that are important in preventing mastitis. One of them is the raising of heifer calves, and the other is the buying of replacements. About the calves first.

Feed them as you like, keep them where you wish, but don't let them suck each other! To begin with, the tiny teats and udders are injured by the sucking and chewing, even when the milk is absolutely free of mastitis bacteria. If mastitis milk is being fed, the germs find ready entrance through the injuries, and things are that much worse. At any rate, a large number of sucked calves are good bets to freshen with blind quarters or diseased udders. So tie them up, pen them up, stanchion them up, but put them up some way so they can't suck each other.

There is just one word to say about buying replacements: CAREFUL! Examination by a veterinarian is the best insurance against bringing in an animal which might start mastitis in a herd.

An ounce of preventon won't get a man's name in the papers as quick as a pound of cure, but it's a lot cheaper, and a heap more reliable. Take a scratch pad, or your good memory, and walk through the barnyard and milking parlor and see if you have any of these mastitis booby traps. They can all be fixed.

*The following six pages are dedicated to all the country summers you have known . . . for nature, having made the perfect plan, indulgently repeats it year after year.*



# *Hey, Old Midsummer!*

HEY, OLD MIDSUMMER! are you here again,
With all your harvest-store of olden joys,—
Vast overhanging meadow-lands of rain,
And drowsy dawns, and noons when golden grain
Nods in the sun, and lazy truant boys
Drift over listlessly adown the day,
Too full of joy to rest, and dreams to play.

The same old summer, with the same old smile
Beaming upon us in the same old way
We knew in childhood! Though a weary while
Since that far time, yet memories reconcile
The heart with odorous breaths of clover hay;
And again I hear the doves, and the sun streams through
The old barn door just as it used to do.

And so it seems like welcoming a friend—
An old, *old* friend, upon his coming home
From some far country—coming home to spend
Long, loitering days with me: And I extend
My hand in rapturous glee:—And so you've come!—
Ho, I'm so glad! Come in and take a chair:
Well, this is just like *old* times, I declare!

—James Whitcomb Riley

# Summer Romance

All of a sudden it hit you! You saw her standing in the sun with the clean wind tossing her hair . . . and the girl in the yellow sunbonnet who cried at your schoolboy taunts was gone. Instead, there stood a woman, slim and sweet and smiling, with dreams in her eyes that two could share. There was a touch of magic in that summer. Somehow, the senses were sharpened. Every bird, every cricket sounded a fanfare for your sweetheart. In the fragrant evenings, there were meetings in the orchard and by the spring-house where the honeysuckle climbs. There were trips to town, and long goodnights. The white clematis on the porch was luminous by moonlight, and the lightning-bugs winked in the distant meadow. There were richer summers in the years together, but none held the magic of the first.

*Rosemary Bader.*

***In vaulted cathedral or log church in the mountains, hearts and lives are joined to the sweet refrain and simple words of "Oh Promise Me."***

# Oh Promise Me

Oh promise me, that some day you and I
Will take our love together to some sky
Where we can be alone, and faith renew,
And find the hollows where those flowers grew,
Those first sweet violets of early spring,
Which come in whispers, thrill us both, and sing
Of love unspeakable that is to be,
Oh promise me! Oh promise me!

Oh promise me that you will take my hand,
The most unworthy in this lonely land,
And let me sit beside you, in your eyes
Seeing the vision of our paradise,
Hearing God's message while the organ rolls
Its mighty music to our very souls;
No love less perfect than a life with thee;
Oh promise me! Oh promise me.

# *The Old Swimming Hole*

"You can't go swimmin' for an hour after dinner, or you'll get the cramps. So's you might as well chop some stove wood." That's the final word from Aunt Martha as the screen door slams. For a while there is the intermittent sound of chopping from behind the summer-kitchen, then silence, then a boy's voice at the kitchen door; "Is it two o'clock yet, Aunt Martha?" As the last few minutes drag past there is only the low hum of boy's voices, punctuated by loud "I betcha's." "I betcha' I'll be the first one in! . . . I betcha' I can stay under the longest." Finally the screen door squeaks open and Aunt Martha gives the word, "Now you can go." The first quarter mile is taken at a run; then panting the boys slow down to a trot. The closer they get to the swimming hole the hotter the stones become. Then there's the clover field to cross, cool and moist to the bare feet. Far in the west there are towering thunderheads, motionless in their majesty. The heavy, sweet breeze from the black locusts in bloom across the creek is spiced with a trace of mint. Only the clank of Uncle George's mowing machine following the wandering creek meadow breaks the spell of the growing, vibrating world. The last few yards are done at a sprint and clothes are shed on the run. A stinging splash of a "belly-whacker" is the start of an afternoon of splashing, diving and baking in the sun that is never matched on exclusive beaches or in tiled pools. Here you can know the cooling softness of water along your full naked length. Here you can be half porpoise and half boy. It's good fun to tie your best friend's clothes in knots and hide them in the bushes, even if you know that he will do the same to yours. This is the old swimming hole. This is the kind of a summer day that country boys carry in their memory always; when they think of summer, these smells and sounds and feels come rushing back.

TO PREVENT winter storm damage, tobacco tents are put up in April. After the preparation of the seed bed the planting is done and the walls added. Late snows and hail are feared more than wind. The posts and wire are permanent; top cloth is new each year and walls are made from the tops of the year before. It's hot and muggy working under a tent in mid-summer.

# TENT TOBACCO

By PAUL V. D. HOYSRADT

Tourists driving down the Connecticut River Valley above Hartford in spring or early summer are amazed to see a good portion of the countryside covered by white tenting. Like a huge table-cloth the tenting covers field after field of the nearly level countryside. Beneath the tenting is grown some of the world's finest tobacco.

The growing of tobacco in Connecticut under the shade of tent cloth began just forty-six years ago. The courage and initiative of a Yankee farmer is responsible for the introduction of the industry in New England.

Back in 1901, neighbors shook their heads when they heard that Ariel Mitchellson, a wide-awake Tariffville farmer, was going to raise his tobacco crop under a tent. His brother, Joseph, had been down in Florida the year before and had become interested in the Federal Government's experiment in raising Sumatra tobacco under cloth shade. The crop had been so fine that the Paris Exposition had actually given this tobacco a higher award than the Sumatra product.

Joseph Mitchellson wondered why the same venture couldn't be tried in Connecticut where the soil and climate were perfect for tobacco raising. He enlisted the government's aid, and M. L. Floyd, a soil expert, came up from Washington to help.

While neighbors scoffed, the Mitchellsons set posts nine feet above ground and a rod apart on four different fields, embracing an eighteen-acre area. Over the posts, on stringers of galvanized wire, cheese-cloth was stretched, closing in the field on every side. The entire covering, including 196 posts to an acre, stringers, wire, cloth, snap-hooks and rings cost about $250.00 an acre. It seemed a foolish waste of money to other Connecticut growers who took it for granted that the only way to raise tobacco was as their fathers and grandfathers had before them, out in the open under God's sky.

As the plants grew, the Mitchellsons watched with satisfaction. Because of the covering, damage from insects was somewhat reduced. The cheese-cloth had been so stoutly strung that even storms couldn't lash and tear the plants. The tobacco came along fine. The tenting provided a continuous tropical climate, varying during the daytime from three to five degrees warmer than that of the open field. It provided a blanket which arrested the effect of the cool spring nights. No longer could the hot sun bake the soil, and more humidity was kept under the covering.

There seemed no end to the advantages of the experiment. The leaves were no longer harmed by the heavy pounding of thunder showers and by the damaging play of the wind. Instead, the water, beating upon the cloth, sifted through and fell in a fine, warm mist upon the plants. The tenting combined the best results of hot-house and open-air planting.

With the idea of getting the finest possible leaf, it was decided not to top the plants. By early summer, the long stalks, standing up like rows of sturdy poles and bearing thin, broad leaves of a vivid green, were touching the roof of their house of cloth.

Tobacco nine feet high! When word of this amazing crop spread among the growers who had been so scornful, they couldn't believe it. They had to come and see for themselves.

They couldn't very well dispute the evidence of their own eyes. As they walked between the rows, their eyes bulged enviously at the great, green leaves three or four feet above their heads. And what leaves they were, too—every one luxuriant and symmetrical, twenty to twenty-four inches long, giving two full cuts without waste—perfect, indeed, in both size and shape for wrappers.

Deeply impressed, the other farmers approached the Mitchellsons in a serious, inquiring mood. They asked all about how the tenting was put up, how much it cost, etc. Their interest was even keener when the tobacco from the first trial field was sold. Though only one-third of an acre, it yielded 700 pounds and brought $473.70 or better than 67½ cents a pound. Tobacco grown in the open seldom fetched more than 25 cents a pound that season.

The Mitchellsons were no longer laughed at. Even the Secretary of Agriculture, Mr. Wilson, came up from Washington to congratulate them. The best Sumatra leaf had been more than matched in the Connecticut River Valley!

In 1946 there were about 7,109 acres of shade tobacco and 11,100 acres of stalk tobacco grown in Connecticut. The industry has spread to tobacco soils in Massachusetts, where in 1946 there were approximately 1,608 acres of shade tobacco and 5,200 acres of stalk tobacco grown.

Shade tobacco is used in making the wrappers for cigars. Cigar wrappers demand only the very finest, thin leaf. It must be strong, full-flavored and free of objectionable irregularities. Only the very poorest grades of shade tobacco are ever used for any other purpose than to make wrappers.

The average price for shade-grown tobacco leaf for 1945, according to the Bureau of Agricultural Economics of the United States Department of Agriculture, was $3.00 a pound. Stalk tobacco grown in the same district brought 70 cents a pound. The tobacco grown under tents is Cuban, known commercially as Type 61. The tobaccos grown in the open are Havana Seed and Broadleaf, known commercially as Types 52 and 51, respectively. The leaves of different types of tobacco vary greatly in thickness, due in part to inherent differences in types and in part to the conditions under which they are grown. It is probable that there would be some difference in flavor between the same type of tobacco produced under a tent and grown in the open. The difference would probably not be very pronounced and would be difficult to detect. Certain types are adapted to cultivation under cloth, other types do better in the open.

Contrary to claims, tents provide little protection against insects and diseases. One of their functions is to diffuse the sunshine but allow enough to pass through for normal growth. The principal purpose of tobacco tenting is to retard the flow of air currents, to increase humidity, and to maintain a constant temperature day and night. There is little difference under a tent between the night temperatures and humidity and those that prevail during the day. The constant high temperature and humidity cause the tobacco plants to grow thinner leaves than they would outside the tent. Growth is not interrupted as much at night as it is in tobacco grown in the open.

Ariel Mitchellson's first tent was made of cheese-cloth and he used lath clamped to the guy wires to support the cloth. Later, however, the manufacturers got around to making a standard tobacco tent cloth which is now universally used. This cloth is not to be confused with a heavier type of cloth used to cover tobacco seed beds. Tobacco tent cloth is made of stronger yarns than cheese-cloth, and has a special weave which is far from being uniform to provide openings for sunshine and rain and to give the cloth sufficient strength to stay in place and to withstand wind and storms. It has closely woven strips at intervals which have eliminated the necessity for the lath sup-

(Continued on page 141)

TOBACCO GROWN under a tent goes up to nine feet and produces 24-inch leaves of the finest wrapper grade. Last year when tobacco grown in the sun averaged 70 cents, shade grown brought from $3.00 to $4.00 per pound. Note support strips in cloth.

# THE BRAHMANS

## The Brahmans Are the Cattle of the Future for the Hot South

By C. FAYE BENNETT

TWO lean, cottonfield negroes sat on the top rail of a barnyard fence in South Carolina and stared goggle-eyed at an animal which vaguely resembled a cow. "Dat's a camel," said one. "Lookit his hump." The year was 1849, and the cow had just been brought from India, the first importation of the breed into the United States.

Today, a hundred years later, tourists driving through the south on their way to Gulf Coast beaches are as puzzled as the colored boys had been at the strange looking Brahman cattle they see grazing along the highway.

To southern cattlemen, the Brahman is the hottest thing that has come down the pike. Brahman is the cattleman's name for Zebu, the sacred cow of India. Until their introduction almost a half century ago as commercial breeding stock they were seen only in circuses and zoos. The 1849 importation in South Carolina was a whim and was soon forgotten.

Elsewhere on this earth, however, the Zebu is a familiar animal, for he is a beast of burden, a source of meat and milk, and a barnyard neighbor of most of the earth's population. There are more cattle of the Zebu type in the world today than there are of any other breed.

The Brahman hasn't changed much since the Hindus domesticated him several thousand years before the Christian era. His loose skin, his hump, long ears, draped dewlap, deep chested body and slender whip-like tail is almost identical in appearance with the Zebu of 6000 years ago. The Hindus and the other peoples didn't do much to improve him,

← BRAHMANS graze contentedly in the tropical sun. These Anthony Farm purebred heifers enjoy a ration of orange peel fed because of its high carotene value.

→ AGAINST A BACKDROP of moss-hung Florida trees this Brahman bull appears to be a survival from a primeval world.

**FOR 6000 YEARS** Zebu cattle and the teeming millions of Asia have been associated in a common cause of survival against the odds of famine, tropical heat, and disease. They are the chief beast of burden in India today. The Hindu, with his curious logic, refuses to eat the meat of the Zebu but he overloads him, starves him, and abuses him generally. Every Indian farm has a Zebu of sorts but the finest cattle are owned by the Maharajas.

RED RAIDER, one of the finest red Brahman bulls, is owned by Milt Thomas, Sarasota, Florida, breeder. "The Raider" weighs 2150 pounds, is six years old, and has a weakness for calf pellets. He's as gentle and tractable as a family cow.

but the Americans, in the fifty years they have been handling his breeding, have altered his chassis considerably.

### What Sort Of Critter Is He?

What kind of a critter is this Brahman? When you say Brahman to most people they think of the wild-eyed, ferocious bunch of steel springs they've seen in newsreel pictures of rodeos. The affectionate, intelligent and tractable Brahman of the breeder's pens and ranches of Texas and Florida is no more like the rodeo version than a house cat is like a man-eating tiger. The Brahman has a mysterious, oriental temperament which is not easily understood by people who know only the English breeds. It takes a smarter man to raise Brahmans than it does to raise English type cattle and you have to be a fast thinker to keep up with them. They're not dumb or "cowlike." The Brahman likes affection, responds to it, and if he is properly gentled he'll follow you around like a dog, answer to his name and return you a great deal of personal satisfaction in raising and caring for him. The Brahman is not treacherous and the problem of how to manage the bulls is no more complicated than how to manage a spirited, intelligent horse. The Brahman is wary and sensitive and a quick movement or a shout will get him excited and send him off at race horse speed to the farthest corner of the ranch. When that third eyelid of his starts flicking, look out; he's disturbed. He's a bad animal when he's cornered and a mother will protect her calf with a ferocity of a wild animal.

That hump on his back is probably the remnant of a reservoir which he drew on during times of famine in his native India. It's not gristle but good, lean meat and it makes a swell pot roast. It disappears almost entirely on the first cross with the English breeds. The bulls have more hump than the cows and both have long hound-dog ears and sad faces.

One of the reasons why the Brahman can withstand the heat is that he sweats like a horse; other cattle breeds sweat very little except through the muzzle and tongue. The sweat glands of the Brahman are concentrated around his neck and shoulders and down into his dewlap. He exudes a brownish perspiration which sometimes stains his hide when it dries. Flies and ticks don't like this, which is all to the Brahman's pleasure. The dewlap provides an extra area for the radiation of heat. It is nothing more than loose skin of wondrous softness and pliability. At 95 degrees his respiration is a normal 45, whereas at this temperature the respiration of English breeds will be around 100. The Brahman's pulse is 70 against 90 for the English type.

The Brahman has a singular protection against the screw worm, which is a dangerous pest for other breeds. In the Brahman the umbilical cord terminates in the end of a long, triangular fold of skin which helps protect it and any infection must travel a long way before it reaches vital parts. The umbilical cord is a favorite gate of entrance for the screw worm. Milt Thomas, a Sarasota Brahman breeder, says that in the eight years that he has bred Brahman cattle he has treated few calves for screw worm.

The Brahman isn't full grown until he is eight years old and the cows and bulls will produce longer than the English breeds. The Norris Cattle Company's Miss

WITH A DIGNITY befitting a matriarch and a queen, Miss Martin rules a large herd of fine Brahman heifers on the Norris ranch in Florida. Miss Martin is 20 years old and is now nursing her twenty-first calf. Brahman cows have calved up to 24 years of age.

A PRODUCT of crossing Aberdeen-Angus with Brahman. This is Essar 314, three-fourths Angus and one-fourth Brahman. He was bred on the Essar Ranch, San Antonio, Texas. At 30 months he weighs 1650 lbs., and has Angus beef conformation.

Martin is 20 years old and has had her 21st calf on the ground. Miss Martin's dam, at 24 years of age, nursed her own calf. Brahman breeders say cows of the breed generally will breed at a slightly older age than the English breeds. Whereas an English bull is just about finished at 10 or 12 the average Brahman bull will function for several years longer. Brahman cows will settle much easier than the English breeds and they no sooner drop a calf than they want to turn around and have another. The weight of the calves at birth is less than that of the English beef breeds. At ten weeks the pure blood Brahman calf has caught up with the Hereford or Shorthorn calf and from then on until weaned walks away in gaining weight.

It's on the butcher block that the Brahman shows one of his good points. He has less viscera than the English breeds. There is not as much waste to the carcass. The fat on the Brahman is not found beneath the skin as a cover, but is laced in the lean meat. Brahman lean meat has enough fat laced in it to fry it well in the skillet. The Brahman dresses out slightly higher than the English breeds. The American Royal Grand Champion Hereford of 1945 dressed 71.58%. At Beltsville, Md., the U.S.D.A. dressed a Brahman at 82%. Brahman calves will average in the high sixties. That's why calves with only a trace of Brahman will usually pay a premium at Gulf Coast stockyards. Calves are fat when they are weaned, usually at six months, at which time they'll weigh around 500 pounds or better. Florida eats a lot of veal because fat calves are much easier to produce than fat steers. They don't produce much dry feed down there to feed out steers. Brahmans shine on the Gulf Coast veal markets.

The Brahman doesn't take his vittles like the English breeds. He eats oftener and less at a time, and he will spend an hour over a ration that a Hereford will finish in ten minutes. He eats pretty much all day and doesn't take time out during the heat of the day to lie in the shade like other cattle.

He has other peculiarities which set him apart from standard breeds. His bellow is a sort of chopped-off roar, deep-throated and explosive. It might be mistaken for the roar of a lion. Little calves have bass voices.

There are about 40 breeds of Zebu cattle in India, ranging in color from light to dark grey, fawn, sand or red. Three breeds, the Gir, the Guzerat, and the Nellore, are most commonly found in America.

### What's Wrong With Him?

Breeders of English types of cattle, the Shorthorn, the Angus, and the Hereford people, are no more prejudiced in favor of their breed than the Brahman man. Most Brahman breeders have bred and handled the English breeds and can make an honest comparison. They will tell you that there is only one thing wrong with the Brahman and that is his temperament. He can't be herded by the same methods as the English breeds. Cowhands can't shout at him

nor handle him roughly. You've got to mix more gentleness with your handling, be more deliberate and quiet. They say that if the Brahman had the temperament of the Shorthorn, he would be a perfect animal. You can't "drive" him; he leads better. He's sometimes hard on fences.

Under the old standards, the Brahman is not a pretty animal. His floppy ears, his hump, and his dewlap give him the appearance of something that has just escaped from a circus. A Brahman bull is a gentleman of tremendous dignity. He appraises you with a keen, wary, calculating eye. Back of his steady gaze are thousands of years of association with the people whose lives are guided by mystic conceptions. He knows his place in the plan of the universe and he won't let you forget that he is one of the oldest of the old.

The Brahman people as yet have not found a way to bring Brahmans along on feed to equal the gain of the Shorthorns, Herefords, and the Angus. In a number of tests they did not make as economical a gain on concentrates and their performance in feed lots fell short of the English breeds. The crosses seem to be less efficient on long feeding than the pure bloods. It is on grass and as veal that they shine. In northern markets Brahmans rarely grade choice and prime. This, the Brahman man says, is because of the standards used by graders are for the English breeds and Brahmans can not be fairly graded by these standards. They don't show finish in the same way.

Table 8 from Technical Bulletin 417 follows in part:

**Average Dressing Percentages**

| Breeding | Sales Weights | |
|---|---|---|
| | Fed 120 Days | Fed 150 Days |
| Hereford | 58.5% | 58.6% |
| Shorthorn | 58.9% | 60.6% |
| Brahman-Shorthorn | | |
| 1st Generation | 61.0% | 60.7% |
| 2nd Generation | 60.6% | 61.2% |

### Home on the Range

Beginning at the Mexican Border on the Gulf Coast of Texas, all around the Gulf through Mississippi, Louisiana, Alabama, throughout Florida and extending into Georgia, and the Carolinas, the Brahman hybrid industry is gaining momentum. Of Florida's 2,000,000 odd head of cattle, more than half carry a generous dose of Brahman blood. Along the Texas Gulf Coast they share honors with the English breeds.

Some Brahman breeders predict a great increase in registered purebloods; others say the trend will be to increase the crosses. The production of purebred Brahmans will be a thriving industry. Purebred breeding stock will always be in demand. Then, too, there will always be cattlemen who like purebreds and will raise the bluebloods commercially when the hybrids are established and the demand for breeding stock falls to normal.

A BRAHMAN calf is smaller at birth than any beef breed but the seven percent milk of his mother boosts him ahead at six weeks and from then until he is weaned he gains steadily on the British breeds. He'll average 500 pounds at five months.

The commercial Brahman of the future, however, may well be of hybrid blood. In Texas, where the cross-breeding of Brahman with the Angus, Shorthorn and Hereford is twenty-five years ahead of any other part of the country, they think they have hit the right mixture on some ranches. The great King Ranch in Texas, owned by Robt. J. Kleburg, Jr., is now almost all on a hybrid basis. Here has been developed the well known Santa Gertrudis, a fixed cross between the Brahman and the Shorthorn. In Florida, they are not so sure of the best mixture. Breeders down there have never been able to fill the demand for purebred Brahman stock and are now only beginning to experiment with fixed crosses. The biggest planned cross-breeding operation in Florida is to be found on the 100,000 acre Norris Cattle Company Ranch near Ocala. Here, using a half and half cross between the Brahman and the Angus, they believe they have found what they want for this particular ranch. On other ranches they have added Brahman bulls to their herds of native cows and let nature take her course. Any cross, and any amount of Brahman blood, improves Florida native cattle, for before the Brahmans came they had reached a place so low the only direction they could go was up.

While some Gulf Coast cattlemen were doing well in up-grading their herds with purebred English bulls, others were having rough going. The chief obstacles were the sub-tropical heat in the summer, and the ticks (until they were eliminated) and insects that worried the cattle down to skin and bones, cut down the milk supply, retarded reproduction and spread the so-called "Texas Fever" that destroyed millions of dollars worth of beef annually. Attempted importation of English type breeding sires from other states failed because of the climate and the ticks.

Though the tough, little native cows could take the ticks, they were snubbed by cattlemen of surrounding states. Georgia shut them out. Irate Kansas met them at the border with rifles and Colorado passed a law prohibiting Texas scrub bulls from running at large in the state. Meanwhile, the demand for scrub cattle shrunk to little or nothing.

The south had year around grazing, unlimited space, plenty of usable, low cost pasture, living springs, streams, ponds and lakes, but no demand for the runty, little cattle of the range. The good grass

IN THE DESERT and semi-arid regions of the west the Brahman and his crosses are displacing the Shorthorn, the Hereford and the Angus. Brahman cows require no help from man to feed and protect their young. These Texas bulls are purebred Brahmans.

in the valleys of the Kissimmee, St. Johns and Peace Rivers in Florida and the frequent coastal rainfalls for one hundred miles inland in Texas, Louisiana and Mississippi made the area a potential cow heaven, but there was, in approximately fifty years time, little improvement in the native stock roaming the wild range. Improved stock did not thrive and beef raised on wild range weighed from 350 to 400 pounds at three to four years old and scrub cows sold for as low as $8.00 per head.

Paul Swaffar, an eastern livestock authority, in speaking of the scrub cow and the part the English breeds and the Brahman have done to improve Florida stock, says: "The scrubs in Florida seem to belong to no one in particular as they just wander around, most of the time on Route No. 1 or No. 17. They are constituted about as follows: Hide 40 per cent; bones 55 per cent, tail 4.5 per cent, muscle 0.5 per cent, and fat 0.0 per cent. They always travel two or three in a group. This way, by leaning against each other they don't fall down so often.

"In spite of the many scrubs, there are some very fine cattle in Florida, and up-to-date ranchmen are doing much to improve their stock. They are doing a good job of improving and acclimating their Angus, Hereford, and Shorthorns, and these crossed on the natives in time make as fine cattle as anyone has. Brahmans are already doing more than their part."

On improved pastures and on supple-

mental feed the English breeds had rejuvenated the industry in the less humid areas, but the need of Gulf Coast cattlemen was for a hardy, quick-maturing beef that would withstand the hardships of heat and insects, and finish with little or no supplemental feeding on low cost, year-around pasture. In this the breeds of cattle created for the colder climates failed.

Long before being introduced to American soil, the Zebu of India had proved to be profitable in the sub-tropical climates of the earth.

Years of famine, disease, heat, the burden of the plow and the struggle to survive have made the Zebu strong and vigorous. They have lived where only the strong can survive. Because they live easily where other cattle fail, because they are strong and adaptable for draught work as well as for milking and beef, their pure and crossbred offspring are used in Asia, South America, Central America, Mexico, Guatemala, the islands of the Pacific, Australia, Africa, Cuba and other sub-tropical areas.

The idea of crossing the Brahman cattle with other breeds in the south had its beginning one hundred years ago when cattlemen noted the exceptional size of the crossbred calves sired by four Zebu bulls which had been presented to the Barrow Sugar Plantation of Louisiana by the English Government in 1854. In 1885 J. M. Frost, cattle commission merchant of Houston, Texas, imported two Brahman bulls from Calcutta, India, for use in his herds. He had earlier bought a few crossbred calves in New Orleans and liked the way they ignored the ticks and heat. A few years earlier, in 1878, a few Brahmans had been imported from Brazil via Mexico.

In 1904, Al McFadden, of Victoria, Texas, purchased a Brahman bull from the Hagenbeck circus. Then the Thomas O'Connor and A. H. Pierce estates of Texas imported thirty-three bulls and four cows from India in 1906. Meanwhile, Brahman bulls and their crossbred calves continued to attract the attention of observing cattlemen. In 1924, seventy bulls were imported from Brazil by F. Ruffier who distributed them generally among Texas breeders. There were eighteen, two to four year old heifers in the Jacobs-Morias importation of 1925, and approximately seventy bulls. All of the females were retained by Dr. William States Jacobs of Houston, Texas, as the foundation for his finely finished herd of 100% pure blood, which has today found its way into the most outstanding Brahman herds of the south.

Future importations were closed until the 1946 importation, by way of Mexico, of eighteen Brazilian bulls by Garcia Brothers and D. V. Guerra of McAllen, Texas. The general demand for new Brahman blood led the U. S. D. A. to lift the ban on importations, but since the recent outbreak of the hoof and mouth disease in Mexico there has been a tightening of restrictions. The 18 bulls which were allowed to cross the Texas border were part of a large shipment from Brazil intended for sale in the U. S. The questionable circumstances surrounding the importation have led to accusations thrown back and forth across the border and have made the affair a storm center of an international controversy. The Brahman bulls are more or less the innocent victims of a broken treaty agreement brought to a head by an outbreak of the hoof and mouth disease in Mexico. All the present day stock is descended from not more than 230 early importations, of which only 25 were females.

### "No", Said The Cattlemen

Many cattlemen will admit that they had to overcome a mighty prejudice against the introduction of Brahmans and the general idea of mixing breeds of cattle in the United States.

"Ten years ago," says Milt R. Thomas, breeder of purebred red Brahmans of Sarasota, Florida, "I swore one would never come on my range. I saw them used as rodeo outlaws. I thought of them as wild animals fit only for the circus tent. I did not like their looks nor their color. But after two years when I saw five to six hundred pound calves out of native knots go to market off of grass, not the equal of my grass, weighing as much as two hundred fifty pounds more than my calves from the same type of native cows and from the best Shorthorn bulls I could get, I concluded I could no longer afford to carry a prejudice that was costing me $25.00 a calf. The lunacy commission was ready to examine me when I bought my first bull for $500.00. In five years, on 537 calves, this one bull returned me a premium of $5,370.00 above the efforts of my next best bulls."

### The Crosses

Approximately 66,000 Brahmans in America are registered, or eligible for registration, five hundred thousand have one-half or more Brahman blood, and there are one hundred thousand quarter-bloods. Uncounted thousands of more distant relatives roam the plains, the rice fields, the swamps and the desert.

Practically every kind of cross between Brahmans and other breeds of cattle have been made. They have been crossed, back crossed, double crossed and crisscrossed. Brahmans plus Herefords, Shorthorns, and Angus cattle are known respectively as Bradfords, Brahorns and Brangus.

THE HALF-BLOOD CROSS, Angus and Brahman, from the Norris Ranch, weighs 1040 lbs., and is 19 months old. The Brahman steer weighs 1300 lbs., and is 20 months old.

THE BEEFMASTER is one of the two fixed crosses bred in Texas, the other being the Santa Gertrudis. These Beefmaster calves average 7½ months old and 564 lbs.

THE IMPORTATION of Red Sindi dairy cattle marks the start of U. S. D. A. experiments to develop a dairy cow for the deep south. Dr. O. E. Reed (left) chief, B. D. I.

U. S. Bulletin No. 1361, issued in 1924, lists a few of the most noticeable observations of crossing Brahmans with other breeds of cattle as follows:

1. Color. The half breed obtained from crossing a purebred Brahman bull with a high grade Hereford or Shorthorn cow is likely to be of such color marking as to show the influence of the dam.
2. Resistance to ticks. The resistance to ticks and other parasites by purebred Brahman cattle and even a very small percentage of Brahman blood is largely responsible for their continued use.
3. Size. The average weight of mature cows in the coast section is about as follows:
   - Natives, 650 to 700 pounds
   - Grade Herefords, 800 to 850 pounds
   - Grade Shorthorns, 850 to 900 pounds
   - Brahmans of ⅝ or higher grade in good flesh, 900 to 1,000 pounds
4. The cows calve regularly. A common ratio where Brahman range bulls are used is one bull for 60 to 75 cows. As high a percentage of calves is received from that ratio as when one range bull of other breeds is allotted for 25 to 30 cows.

A series of crossbreeding experiments were made on a cooperative basis between the King Ranch, of Kingville, Texas, and the U. S. Department of Agriculture and Texas A. and M. College. Tests covering a period from 1920 to 1929 show that a calf by a Brahman sire weighs from 91 to 100 pounds more at weaning time than a calf of any other breed. With all things being equal except the breeding, at seven months the average weight is as follows:

(Table 13, page 11 of U. S. Bulletin No. 417)

Average weight of Herefords and Shorthorns:

| | | |
|---|---|---|
| Non-Brahman | 1924-25 | 470 pounds |
| Non-Brahman | 1925-26 | 417 pounds |
| Total | | 887 pounds |
| Average weight (887÷2) | | 443.5 pounds |

Average weight Brahman-Herefords and Brahman-Shorthorns:

| | | |
|---|---|---|
| Part Brahman | 1924-25 | 541 pounds |
| Part Brahman | 1925-26 | 538 pounds |
| Total | | 1079 pounds |
| Average weight (1079÷2) | | 539.5 pounds |

After 120 days of feeding the part Brahman steers averaged 33.23 pounds more edible meat to the steer. Brahman-Herefords and Brahman-Shorthorns carcasses on the rail in the packing house averaged 58.51 pounds heavier than the Herefords and Shorthorns coming from the same or nearby pastures at about seven months old. The Brahman carcasses yielded a higher per cent of finely marbled meat with less waste fat and a higher dressing per cent on the block, but

the meat was slightly coarser.

A report on the University grade herd in southern Louisiana from 1930 to 1933 on weights kept from birth to weaning shows the rate of gain per day to be:

Brahman crossbreed calves
1.86 pounds per day

Non-Brahman calves
1.59 pounds per day

In 1931-32

One-half Brahman calves weighed over 500 pounds at weaning

One-quarter Brahman calves weighed over 500 pounds at weaning

Non-Brahman calves weighed from 426 to 471 pounds at weaning

One-half Brahman yearling heifers weighed 733 pounds

Non-Brahman yearling heifers weighed 649 pounds

The 1941 experiment with grade yearling heifers shows the grade Brahmans made much more rapid gains on pasture alone than other heifers. Several Brahman crossbreeds made over 300 pounds gain on grass in 167 days, or practically two pounds per day.

"Strange as it may seem," says E. C. Stone, editor of the Brahman Breeder-Feeder Magazine, "Brahman calves are a little lighter at birth than the average calves from Herefords, Shorthorns and Aberdeen Angus. For this reason there is less mortality in cows and heifers."

### Question: What Cross Is Best?

Since every owner of Brahman cattle has either settled on his own particular goal for his own particular type, or the discovery of something new as the result of experimental breeding, there are many different systems of breeding in progress today.

After eleven years of experimental breeding at the Jeanerette Experiment Station in Louisiana, which began in 1916, best results as measured by weight at birth, at six months, and two years in case of heifers, were obtained by crossing Aberdeen Angus cows with Brahman bulls, backcrossing the first generation halfbred heifers with Aberdeen Angus sires, thereby producing ¼ Brahman—¾ Angus.

Many commercial breeders began with British bred or native cows and gradually built up their herds with Brahman bulls. Though much indiscriminate breeding was done in the early history of the industry and as little as ⅛ Brahman blood was considered a safeguard against heat and disease, better animals are being turned out today with the use of good bulls and a higher percentage of Brahman blood in crossing with all breeds of cattle.

### Brahmans In Texas

Many dairymen have found, like John Gosler, Route 3, Houston, Texas, that crossbreeding Brahman and Jersey cattle is profitable in many ways. When a dairy cow is no longer profitable for milk production she will raise a fine Brahman calf. While the average dairy cow, hauled to the slaughter house, will bring about 50% of her value, this same cow bred to a Brahman bull will raise one or two calves and pay for herself.

THE RED BRAHMAN heifer munching on Milt Thomas' hat is Lady in Red, who brought top price of $2100 at the 1947 sales at Ocala, Florida. A Brahman likes affection.

The Santa Gertrudis cattle of King Ranch, Texas, are the result of twenty-five years of scientific breeding. With a foundation of ⅜ Brahman and ⅝ Shorthorn, they reproduce their kind and breed true to color, which is red. The Santa Gertrudis, a large, vigorous, blocky type, is now considered a separate breed.

As early as 1908 the Lasater Ranch of Falfurrias, Texas, started the breeding system from which the present day Beefmaster Type developed. Beefmasters are approximately 50% Brahman, 25% Hereford and 25% Shorthorn. The Beefmasters, bred for weight and sold by weight, are a blended strain of cattle bred to produce choice, quick maturing, heavy calves at eight months under range conditions with no supplemental feeding. The head of the herd, the Beefmaster himself, weighs 1875 pounds after six years in service on the range with no supplemental feeding.

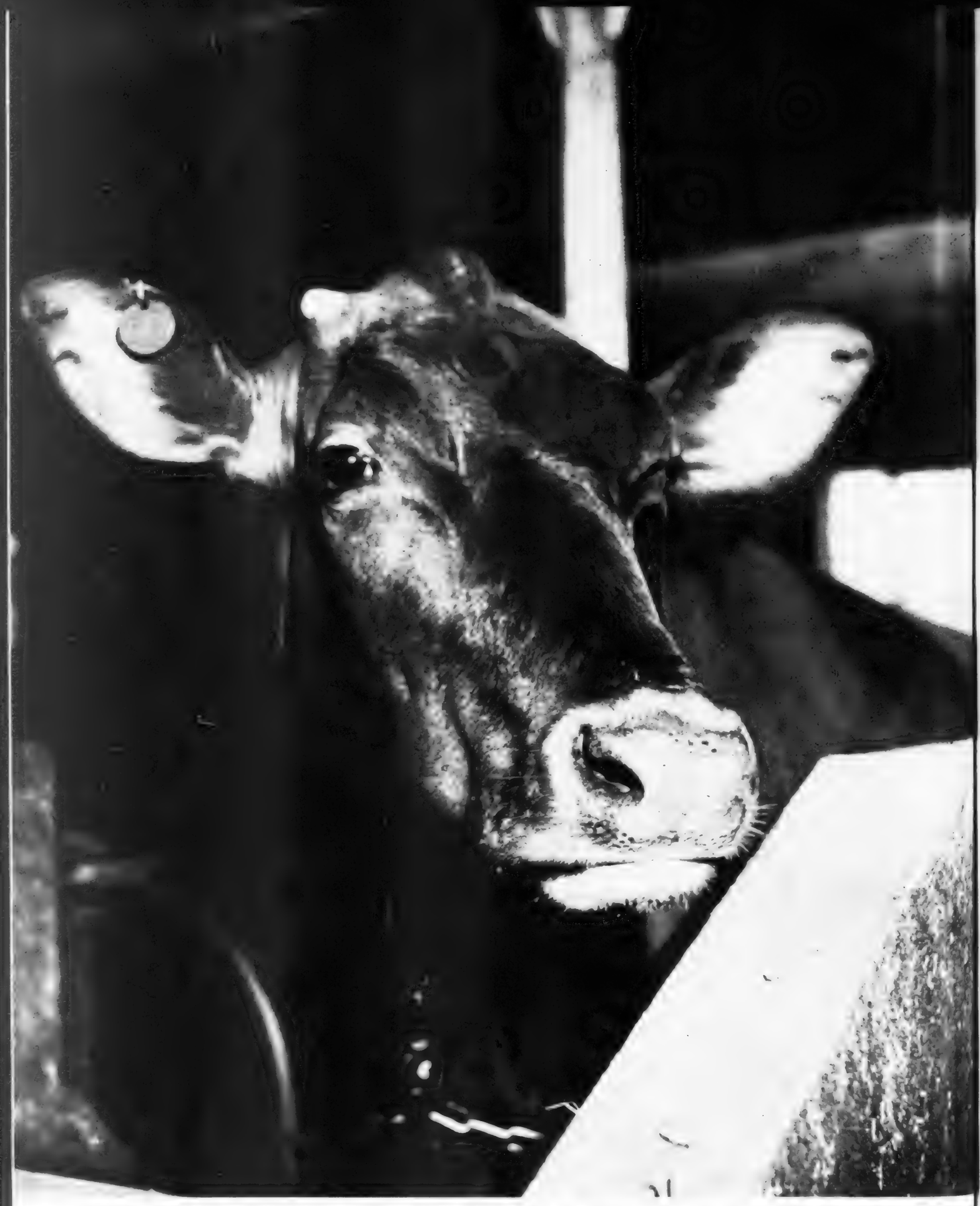
Texas got the jump over other gulf states in Brahman development and is twenty-five years ahead. The immense King ranch leads the way with its fixed type Santa Gertrudis breed, but up and down the coast, and slowly infiltrating inland, the Brahman is displacing all other breeds.

The J. D. Hudgins Ranch of Hungerford, Texas, has, for several cow generations, stressed the breeding of heavy, beef type Brahmans.

From the original importation of 18 purebred heifers and 70 bulls in 1925, Dr. William States Jacobs of Houston, has kept his stock pure. He has weeded out animals with bad dispositions and questionable lines of conformation, and has added increased size and vigor to the powerful blood of the Brahman. The blood of Maroto and Old Bob, famous breeding sire and dam of the original importation, has gone into most of the herds of the south and many Pan-American countries.

The newly organized Pan-American Zebu Association, of which Mr. Hogue Poole of Cotulla is President, states its

(Continued on page 122)



*ONE OF THE CROSSBRED DAIRY COWS at the U.S.D.A. Agricultural Research Center at Beltsville, Maryland. Her milk and butterfat production records and those of others like her may give the answer to the farmer's question, "What happens when I cross different breeds of dairy cows?"*

# *The* CROSSBRED COW

## Focal Point of a Controversy, Her usefulness is being checked at the Milk Pail

WHEN the talk shifts to seed corn most farmers agree that the hybrids are the most profitable development that has taken place for many years. Plant a grain of corn and you have 1,000 offspring to study in a few months. But developing hybrid animals brings different problems. It may be one, two or three years before an animal breeder can check the performance of hybrid offspring.

There have been some genuine successes with hybrid farm animals; the best known example, of course, is the mule, the result of mating the ass to the horse to produce a rugged draft animal. In the last decade, other hybrid farm animals have been accepted by farmers in various parts of the country. The Minnesota No. 1 Hog, the result of mating Tamworth sows to a Landrace boar, was bred to meet the demand for a lean carcass. Brangus, Braford and Brahorn cattle, the offspring of the Brahman bull mated to English bred cows, are beef animals that have been produced to resist the heat and insects in the southern states. Blue Grass Lambs were developed by mating Hampshire cross western ewes to a Southdown ram, to produce blocky, early-market lambs.

But to tell the story of experiments made to increase milk production among dairy cattle by crossing breeds is to fish in troubled waters. Only the opening pages of the story may be told, and the material is so fresh that before a few years have gone by, the pages may be torn out, and the tale begun anew.

### Mendel Worked With Peas

It remained for an Austrian monk, working and thinking in the silence of the monastery at Brünn, about the time of the Civil War, to discover the laws of inheritance which since have been the generating force of the science of genetics. Johann Gregor Mendel had much of the precious ingredient of research, time. His search and experimentation were thorough. So thorough was the report of his eight years' work which he published in 1866, that with this data it would have been possible for the plant and animal breeders to sit down and figure out: (1) the exact number of different forms in which the offspring of a hybrid mating would appear, (2) the arrangement of these different forms in each following generation and, (3) the mathematical relationship between these forms. But Mendel was far ahead of his time, and his report lay in the monastery library collecting dust until 1900. Then a parallel course of research by three other Europeans, De Vries, Von Tschermak and Correns, in 1900 brought the work of Mendel to light. Since that time progress in genetics has been rapid. It would be difficult to estimate the benefit to mankind that has come about by the specific knowledge in this field. Plants have been the recipients

**THE CROSSBREEDING EXPERIMENT was started at Beltsville in 1939. Since that time every cow has been checked for milk and butterfat production under dairy conditions. The latest results of the tests are given in tables on pages 57, 58 and 102.**

**Over a year has gone by since the Bureau of Dairy Industry of the U. S. Department of Agriculture made its first "Progress Report" on the Crossbred Dairy Cattle Experiment being conducted at the Agricultural Research Center at Beltsville, Maryland. For the benefit of readers who have not read recent reviews of the Crossbred Dairy Experiment, we should point out that there has been a great deal of criticism of the government work. Many people have attacked it. Some have taken neither the time nor trouble to authenticate their facts, nor see the cattle personally. On the other hand, the results of the experiment have been given wider publicity than was expected or deserved, considering the short time the work has been in progress. FARM QUARTERLY Editors have visited Beltsville; they watched the cattle being handled, saw the feeds, studied the milk records, and talked to the herdsmen who work with the cows. Calves, including those of fourth-cross, were observed. There has been no attempt to draw conclusions in this article that would induce any cattle breeder to change his present breeding methods, save for the sake of personal experimentation.**

HER FIRST VISIT to the photographer. This is X-50, a three-breed combination heifer at 6 months. Her dam was X-7, a two-breed crossbred cow, whose dam was a Jersey and sire was a Red Dane. X-50's sire was the proved Holstein bull, Number 966.

ABOVE: X-50 at 1 year and 6 months. BELOW: at 2 years when she was starting her 365 day record. She gave 16,186 pounds of milk, with 643 pounds of butterfat, which figures 3.97% butterfat. X-50's dam gave 586 pounds of butterfat in 365 days.

of by far the most intensive research. Now, with the possibilities in hybrid animal research as great as or greater than with plants, the work is being picked up at the stage it stood 30 years ago in plant work.

### Hybrids Have Vigor

Among genetictists the commonly accepted belief is that when good animals of different breeds are crossed, the offspring frequently have more vigor, and often the ability to produce more abundantly.

Human nature being what it is, it was only a matter of time before someone got the idea that by crossing dairy breeds, a more vigorous animal could be developed that would give more milk and butterfat. The idea itself is not new; farmers have always done it; the new thing about the story today is that long-time, controlled experiments are under way to see if this idea has any merit. Thirty-six years ago, a college first tried the idea. At the Framingham, Mass., Experiment Station in 1911, Guernsey and Holstein cattle were crossed. These animals were later transferred to the University of Illinois, where studies on the inheritance of fat and other milk constituents were continued without decisive results.

In 1912, Cole and Fuller at the University of Wisconsin crossed Holsteins and Guernseys with Angus cattle to get genetic data about the crossing of breeds that had marked differences. Some data were published on the milk production results, but they were not conclusive.

At the Maine station in 1918, Gowen crossed Angus with dairy cattle to the second generation. Although the dairy and beef qualities blended to a fair extent, the dairy type hindquarters and the beef forequarters tended to be dominant in the hybrid offspring. Later a similar experiment was run at the Alaska station to get a hardier strain of dairy cattle through crosses between Holsteins and Galloway breeds. The general result was a beefy dairy cow with greater spring of rib and more flesh than the Holsteins, but this was about all.

### "L'affaire Mount Hope"

Older dairymen have not forgotten the only extensive private cross-breeding experiments, those of E. Parmalee Prentice.

A very successful lawyer, he was once asked by a young man, "How can I get ahead quickly?"

"The two best methods," Prentice replied, "are to write a book, or marry the boss' daughter; I did both."

And Prentice did both on a grand scale. His list of books is extensive, the last one being "American Dairy Cattle". The boss' daughter he married was a Rockefeller.

Prentice bought a purebred dairy herd for his Mount Hope Farm at Williamsburg, Mass. When the herd failed to produce what he thought they should he went back to the Association and the breeders to get some adjustment. Failing in this he

started on a campaign of experimental breeding which made him a thorn in the side of the purebred associations for over a decade. Being a very wealthy man he took advertisements in the breed papers to point out the shortcomings of purebreds and the breed associations. Dr. Goodale, a geneticist, was part of the staff at Mount Hope and a great many crossbred cattle became a part of the herd. Prentice lectured before dairy groups all over the country telling how well his crossbreds were working out. He founded the American Dairy Cattle Club, and stimulated thinking among cattle breeders. Unfortunately, the data dealing with the results at Mount Hope were never published. The last word coming from Mount Hope in regard to its publication was, "We hope to get around to it some day."

Some men's brains work only on opposition, and the various cow breed associations are now offering plenty of criticism to the cross-breed experiments being conducted by the U. S. Department of Agriculture. College professors, who have been active in dairy industry research, have also been among those who have spoken out against it.

Dr. Yapp of the University of Illinois characterized the work as "the dissipation of good blood in a half-baked experiment." According to the minutes of the meeting at Rockford, Illinois, where he made this statement, Dr. Yapp did not elaborate in any greater detail.

### The Beltsville Experiment

The Department of Agriculture's cross-breeding experiment with dairy cattle was started at The Research Center at Beltsville in 1939 under the direction of M. H. Fohrman, Head, Division of Dairy Cattle Breeding, Feeding and Management Investigations, and Ollie E. Reed, Chief, Bureau of Dairy Industry. These are the same men who are responsible for supervision and direction of the fine purebred Holstein and Jersey herds at Beltsville. Incidentally, the Holstein herd finished second on the Holstein-Friesian Association's Honor Roll in 1945 with 516 points for 26 animals.

Fohrman, who is in charge of the cattle, is a middle size, dry-witted and unemotional man. He divides his time between Beltsville and Washington. His office in Agriculture Building in the city is a combination of a research library and a statistician's workshop. Now over 50, Fohrman has mellowed less than most men. A man with a critical mind, he feels that the purebreed associations have a great opportunity to give aid to commercial dairymen by supplying them with "proven bulls rather than fashionable pedigrees."

We asked him, "How did the Dept. of Agriculture get into cross-breeding."

"Our decision to start the cross-breeding experiment was carefully considered," answered Fohrman, thumbing through his files to pull out a letter. "For some time people had been writing the department for information on cross-breeding. Typical of the letters we received was one from a county agent in New York State. He wrote, 'I have commercial dairymen who want to use a white face beef bull on their dairy cattle in hopes of getting a better price for their cull and bull calves. What shall I tell them?' There wasn't much information available on what happens when you cross-breed dairy cows. Up to this time, most of the writing had been in the vein of caution against it. The most frequently repeated warnings had been that if Holstein and Jerseys were intermated, the resulting offspring would produce Jersey quantity and Holstein quality of milk. It is our belief that this may be true with random bred animals of these two breeds. Holstein quantity and Jersey quality of milk are as likely to occur as the reverse, but the great majority of the hybrid animals we know now will produce at a middle point between the two breeds for both milk and percentage of butterfat."

**PRODUCTION RECORDS OF CROSSBRED COWS OF VARIOUS 2-BREED COMBINATIONS**

| Cow No. | Milk | Butterfat | | Age | Remarks | Sire |
|---|---|---|---|---|---|---|
| | Pounds | Pct. | Pounds | Y. M. | | No. |
| **Jersey X Guernsey:** | | | | | | |
| X-13 | 10,653 | 5.27 | 562 | 2 2 | | 1565 |
| **Jersey X Holstein:** | | | | | | |
| X-1 | 9,785 | 4.85 | 475 | 2 0 | | 1114 |
| X-3 | 13,065 | 4.71 | 615 | 1 11 | | 1114 |
| X-17 | 13,837 | 3.85 | 533 | 2 3 | | 1102 |
| X-32 | 13,728 | 3.94 | 540 | 1 11 | | 1565 |
| X-35 | 10,508 | 5.24 | 550 | 2 1 | Mastitis | 1114 |
| X-41 | 12,453 | 4.63 | 576 | 2 5 | | Do. |
| X-47 | 12,189 | 5.13 | 625 | 1 8 | Barn bred too early | Do. |
| X-42 | 9,417 | 4.90 | 462 | 3 3 | 2nd lactation | 1114 |
| **Holstein X Jersey:** | | | | | | |
| X-5 | 13,032 | 4.62 | 602 | 2 4 | | 966 |
| X-11 | 12,584 | 4.82 | 606 | 2 4 | | Do. |
| X-20 | 12,383 | 5.13 | 636 | 1 11 | | Do. |
| X-30 | 11,867 | 5.60 | 664 | 2 0 | | Do. |
| X-38 | 11,929 | 5.09 | 607 | 2 1 | | Do. |
| X-40 | 13,690 | 4.74 | 649 | 2 8 | | Do. |
| X-51 | 13,800 | 4.44 | 613 | 2 5 | | Do. |
| **Holstein X Guernsey:** | | | | | | |
| X-16 | 14,577 | 4.68 | 683 | 2 5 | | 966 |
| X-26 | 11,717 | 4.84 | 567 | 2 0 | | Do. |
| X-28 | 14,052 | 4.63 | 651 | 2 3 | | Do. |
| X-33 | 11,363 | 5.53 | 629 | 2 0 | | Do. |
| X-43 | 11,990 | 4.12 | 494 | 2 4 | Mastitis | Do. |
| X-44 | 15,284 | 4.10 | 627 | 1 11 | | Do. |
| X-45 | 11,341 | 4.95 | 561 | 2 9 | | Do. |
| X-59 | 9,471 | 4.75 | 450 | 2 9 | Incomplete 262 days | Do. |
| | 1 more to calve | | | | | |
| **Holstein X Red Dane:** | | | | | | |
| X-15 | 12,730 | 4.04 | 514 | 2 3 | | 966 |
| X-85 | 1,178 | 3.89 | 46 | 2 2 | Incomplete 33 days | Do. |
| X-87 | 2,177 | 3.67 | 80 | 1 11 | Incomplete 59 days | Do. |
| | 3 more to calve | | | | | |
| **Red Dane X Holstein:** | | | | | | |
| X-14 | 13,643 | 4.05 | 552 | 2 2 | | D-501 |
| X-22 | 16,949 | 3.60 | 611 | 2 2 | | D-501 |
| X-23 | 14,636 | 3.77 | 552 | 2 0 | | D-501 |
| X-46 | 11,103 | 4.05 | 449 | 1 11 | Mastitis | D-501 |
| X-56 | 16,100 | 4.08 | 657 | 2 0 | | D-501 |
| X-58 | 13,956 | 4.27 | 596 | 2 4 | | D-501 |
| X-63 | 17,393 | 3.83 | 665 | 2 4 | | D-501 |
| **Red Dane X Jersey:** | | | | | | |
| X-7 | 12,228 | 4.80 | 586 | 2 7 | | D-501 |
| X-10 | 12,561 | 5.03 | 631 | 1 11 | | D-501 |
| X-18 | 13,315 | 5.06 | 674 | 2 2 | | D-501 |
| X-29 | 12,691 | 4.56 | 579 | 1 11 | | D-501 |
| X-70 | 11,579 | 4.47 | 518 | 1 11 | | D-501 |
| **Red Dane X Guernsey:** | | | | | | |
| X-21 | 14,614 | 4.12 | 602 | 2 1 | | D-501 |
| X-52 | 14,044 | 4.30 | 603 | 2 2 | | D-501 |
| X-53 | 14,055 | 4.79 | 674 | 1 11 | | D-501 |
| X-61 | 12,463 | 4.35 | 542 | 1 11 | | D-501 |
| X-73 | 11,292 | 4.19 | 473 | 2 0 | Incomplete, 319 days | D-501 |
| X-74 | 5,778 | 4.61 | 266 | 2 4 | Incomplete, 174 days | D-501 |
| | 1 more to calve. | | | | | |
| **Jersey X Red Dane:** | | | | | | |
| X-67 | 3,994 | 5.39 | 215 | 2 10 | Incomplete, 116 days | 1114 |
| X-86 | 5,178 | 4.71 | 244 | 1 11 | Incomplete, 152 days | 1114 |

**COMPLETED RECORD SUMMARY**

| | | | | |
|---|---|---|---|---|
| 40 | 2-breed crosses average | 12,983 | 4.56 | 588 |
| 40 | Dams average | 10,673 | 4.60 | 460 |
| | Difference | +2,310 | —.04 | +128 |
| | Number better than dams | 31 | 18 | 36 |

THIS IS PAUL B. STRICKLER of Grassley Farm, near Waterford, Virginia, with one of the crossbred cows which the U.S.D.A. has loaned out to commercial dairy farms. Strickler is enthusiastic about his crossbreds and says, "If a bull has a group of daughters producing more than their dams, that's all I need to know."

PRODUCTION RECORDS OF CROSSBRED 3-BREED COMBINATION COWS

| Cow No. | Breed Combination and number of dam | Actual Production | | | Age | | Remarks | Sire |
|---|---|---|---|---|---|---|---|---|
| | | Milk | Butterfat | | | | | |
| | | Pounds | Pct. | Pounds | Y. | M. | | No. |
| **Sired by Holstein Bulls:** | | | | | | | | |
| X-50 | RD X J (X-7) | 16,186 | 3.97 | 643 | 1 | 11 | | 966 |
| X-57 | RD X J (X-18) | 3,320 | 5.33 | 177 | 3 | 8 | Incomplete, 65 days | 966 |
| X-62 | RD X J (X-29) | 16,862 | 3.92 | 661 | 1 | 11 | | 966 |
| X-69 | RD-J X H (X-39) | 13,954 | 4.27 | 596 | 2 | 1 | Incomplete, 336 days | 966 |
| X-78 | RD X G (X-21) | 3,951 | 4.41 | 174 | 2 | 5 | Incomplete, 114 days | 966 |
| X-82 | RD X J (X-10) | 2,032 | 4.60 | 94 | 2 | 6 | Incomplete, 43 days | 966 |
| X-88 | J-RD X H (X-48) | 1,993 | 4.64 | 92 | 2 | 3 | Incomplete, 43 days | 966 |
| X-90 | RD X J (X-18) | 3,113 | 4.92 | 153 | 2 | 0 | Incomplete, 91 days | 966 |
| | 11 more to calve. | | | | | | | |
| **Sired by Red Dane Bulls:** | | | | | | | | |
| X-39 | J X H (X-3) | 13,992 | 4.35 | 609 | 1 | 11 | | D-501 |
| X-54 | J X H (X-17) | 16,500 | 4.16 | 686 | 1 | 11 | | D-501 |
| X-55 | H X G (X-16) | 15,284 | 4.47 | 684 | 2 | 1 | | D-501 |
| X-60 | H X G (X-26) | 15,036 | 3.98 | 598 | 1 | 11 | | D-501 |
| X-65 | H X J (X-5) | 12,896 | 4.67 | 602 | 1 | 11 | | D-501 |
| X-66 | H X G (X-28) | 16,029 | 4.45 | 714 | 1 | 11 | | D-501 |
| X-68 | J X H (X-35) | 10,545 | 5.09 | 537 | 2 | 3 | Incomplete, 300 days | D-501 |
| X-71 | H X J (X-38) | 11,926 | 4.62 | 552 | 2 | 0 | Incomplete, 331 days | D-501 |
| X-75 | H X J (X-20) | 9,864 | 5.19 | 512 | 1 | 11 | Incomplete, 305 days | D-501 |
| X-79 | J X H (X-17) | 2,675 | 5.02 | 134 | 2 | 5 | Incomplete, 93 days | D-501 |
| | 15 more to calve. | | | | | | | |
| **Sired by Jersey Bulls:** | | | | | | | | |
| X-48 | RD X H (X-14) | 12,668 | 5.07 | 643 | 2 | 0 | | 1114 |
| X-77 | H X RD (X-15) | 9,859 | 4.24 | 418 | 2 | 0 | Incomplete, 287 days | 1114 |
| X-81 | RD X H (X-23) | 8,667 | 4.83 | 418 | 1 | 11 | Incomplete, 275 days | 1114 |
| X-83 | RD X H (X-22) | 7,451 | 4.88 | 364 | 2 | 0 | Incomplete, 216 days | 1114 |
| X-89 | RD X H-H X J (X-49) | 3,837 | 5.37 | 206 | 1 | 11 | Incomplete, 138 days | 1114 |
| | 6 more to calve. | | | | | | | |
| **Sired by Red Dane X Holstein Bull:** | | | | | | | | |
| X-49 | H X J | 14,082 | 4.68 | 658 | 2 | 0 | | X120 |
| | 1 more to calve. | | | | | | | |
| **Sired by Red Dane-Jersey X Holstein Bull:** | | | | | | | | |
| | 3 daughters of X-179 to calve. | | | | | | | |
| **Sired by Red-Holstein X Guernsey Bull** | | | | | | | | |
| | 9 daughters of X-191 to calve. | | | | | | | |
| **COMPLETED RECORD SUMMARY** | | | | | | | | |
| 10 | 3-Breed Crosses average | 14,953 | | 4.37 | | | 650 | |
| 10 | 2-Breed Dams average | 13,143 | | 4.56 | | | 597 | |
| | Difference | + 1,810 | | — .19 | | | + 53 | |
| | Number daughters better than dams | 8 | | 3 | | | 9 | |

### Experiment Starts In 1939

With the support of Henry A. Wallace, then Secretary of Agriculture, the cross-breeding experiment was started, "to explore the field of cross-breeding dairy cattle and to develop useful information," to quote the U. S. D. A. Another of the aims was to "create a new breed of dairy cattle, red in color." This color was selected because red culls and calves bring better money on the western beef markets. It was hoped this new strain would be rugged, and large and have the milking ability of the best dairy breeds.

Since only 3% of the dairy cows in this country are registered, cross-breeding has been practiced in a haphazard way as a matter of survival by many farmers who own the remaining 97% of the dairy cattle. The questions coming from these men gave the research staff of the U. S. D. A. the principal objective of the experiment, "to explore the field of cross-breeding so that some sound recommendations could be made from long-time records for those who insist on trying something new."

According to the U. S. D. A. figures, the present average yearly yield for all dairy cattle in United States is 4,578 pounds of milk and 182 pounds of butterfat. These figures indicate that the average owner of commercial dairy cattle would be interested in anything that shows promise of giving him improved milk and butterfat production.

### Cross-breeding Isn't New

A geneticist defines cross-breeding as a form of out-breeding, which is the mating of unrelated animals of different color, type and propensities. And this form of breeding has been practiced by many farmers, with varying results. The farmer who starts to "grade-up" his herd of non-descript cows by using purebred sires, of some standard breed of dairy cattle, is using cross-breeding. He uses the germ plasm of the purebred sire to breed his common cows, hoping to get greater outward uniformity as well as better production. He may have Jersey type grade cows which he breeds to a purebred Jersey bull, or he may use a Guernsey bull, hoping to develop a Guernsey type grade herd.

His chances of accomplishing this with a purebred sire are greater because purebreds have been selected for generations to fix and transmit specific qualities of milk and butterfat production.

It is obvious that Mr. Wallace and the research men were influenced by the tremendous success of hybrid corn and other examples of what "heterosis," or hybrid vigor, could do for animals and plants.

But the path of research backs and fills, never going forward in a straight, unwavering line. One of the original goals, of creating a new breed of red dairy cattle, has been side-tracked because the emphasis has been put on the checking of the production records of the second and third-cross hybrids, without regard for the color line.

In tracing the course of the experiment at Beltsville, Fohrman says, "We started cross-breeding in 1939 and worked along quietly to observe results under controlled conditions. Our proved sire work with pure bred cattle had convinced us that much could be accomplished by the introduction of production genes through the use of sires that had demonstrated their ability to transmit producing ability to their offspring. When word was spread by visitors about the results we were having, it was decided to release a progress report on May 13, 1946. At that time, we had about 50 females of two and three-breed crosses that had come into production. All of the animals had been under uniform environmental conditions while undergoing production tests. In this report no broad recommendations for promiscuous cross-breeding were made. The ability to produce milk and butterfat at a high level is a characteristic which is inherited by dairy cattle. A heifer which is endowed with that ability from both her sire and her dam will be able to produce well despite the difference in color or breed of her parents. The records of the crossbred cattle have been published on the basis on which they are made, three milkings a day for 365 days. The Bureau of Dairy Industry has strongly advocated the method of publishing milk records on the same basis on which they are made, to avoid the use of correction factors."

### The Foundation Animals

All the foundation females used in the Beltsville experiment, were of known producing ability. The transmitting ability of the males had been proved. It was felt that blending this proved stock might bring forth the hybrid vigor that results from crossing breeds of plants and animals.

Four dairy breeds were included in the experiment: Holsteins, Jerseys, Guernseys, and Red Danes. Foundation females were brought to Beltsville from the Bureau's field station herds, where the proved-sire system of breeding has been in use for a number of years. The Holsteins were from Huntley, Montana, and the Mandan, North Dakota, stations; the Jerseys from the Lewisburg, Tennessee station; and the Guernseys from the Sandhill, South Carolina station. Females of the Red Dane breed were available at Beltsville, as were sires of the Holstein, Jersey, and Red Dane breeds.

The major plan of the experiment differed from the usual pattern of cross-breeding, in that it called for continuous introduction of new genes (units of inheritance) through the use of proved sires of the various breeds. The females resulting from the mating of two breeds—Holsteins and Jerseys, for example—were mated to the Red Dane sire for the three-breed crosses. The resulting three-breed females in this case are then mated to either a Jersey or Holstein proved sire in a second round of the three breeds.

All crossbred females are weighed and measured periodically, and their producing ability is determined in the first lactation period under uniform environmental conditions. They are barn fed during the first lactation period because pastures at Beltsville vary with weather conditions and also because the beneficial effects of pasture grass would not come to all cows at the same stage of lactation. The cows are fastened in stall ties, but in good weather they are turned out in a dry lot for a short time

(Continued on page 102)

RESULTS OF UP TO NOW IN THE CROSS-BRED CATTLE EXPERIMENT

| GROUPS | AVERAGE FOR 365 MILKING DAYS | | |
|---|---|---|---|
| | POUNDS OF BUTTERFAT | POUNDS OF MILK | PER CENT OF BUTTERFAT |
| Group No. 1 (Foundation Cows) Purebred cows (Holstein, Jersey and Guernsey) | 477 | 11,119 | 4.37 |
| GROUP No. 2 First Cross (Group No. 1 cows crossed with purebred bulls of breed other than own) | 588 | 12,983 | 4.56 |
| GROUP No. 3 Second Cross (Group No. 2 cows crossed with purebred bulls) | 650 | 14,953 | 4.37 |

BELOW: A part of the Beltsville cross-bred dairy herd entering the barns. They are barn fed and are turned out in the dry lot for exercise on good days. The barns are not heated and the cows are all milked by hand, three times daily.

# Quarter Horse

## King of the Range and the Ranchmen's Best Utility Horse

AS EARLY AS 1630 the village fathers of the towns of Charleston and Richmond had the problem of wild youth on their hands. One way the boys let off steam was to chase wild cattle down the dusty streets and into any convenient "cow-pen".

Already a name had been coined for them, "cow-boys"; and this was not entirely complimentary. On their fast, deep-barrelled horses they could make a pivot on a dime, or at any rate, short enough to make a dashing greeting to any pretty girl who happened to be on the street. The horses they rode became known as "Quarter Horses" because of their speed at a quarter mile run. Quarter mile horse races were popular and by 1690 large purses were being offered in Virginia.

The Quarter Horse came to this country from England and was an established breed ahead of the Thoroughbred. In his breeding here he has undoubtedly picked up some Spanish blood as well as some Thoroughbred. Quarter Horse people think that it is possible that the Morgan Horse is a Quarter Horse. Certainly there is a similarity in conformation.

One of the first stockmen to become interested in Quarter Horses was William (Billy) Anson of Christoval, Texas. He came from an aristocratic English family, and like many of the younger sons of the nobility, came to America in the last half of the nineteenth century to make his fortune and live the frontier life. The British Government commissioned him to buy horses during the Boer War, and while he was doing this he was so impressed with Quarter Horses he saw, that he bought a number for his Head-of-the-River Ranch on the Concho. A number of his horses bore the stamp of "Steel Dust", which to a Quarter Horseman is like the Jensen Acorn on silver. His breeding did much to develop the present type of horse.

For hundreds of years the Quarter Horses have been working with cattle, and to the ranchmen of the Southwest they have come to be the most valuable utility breed. They are animals with great endurance and endowed with natural cow-sense. At cutting-in the herd the Quarter Horse can out-smart the wildest and most agile steer. For roping he has the speed to overhaul and the knack to "bust" the toughest renegade. He has to be tough to take the jerk of a 1400 pound steer at the business end of rope. And he can do it all day long!

As a breed average he rarely stands higher than fifteen hands, but because of his stocky build he often weighs 1200 pounds. Typical Quarter Horse characteristics are small, alert ears, a heavily muscled thigh and forearm, short legs that are firmly jointed, with the knee and pastern close together. The stud books of the American Quarter Horse Association, Amarillo, Texas, show that the color scheme runs about the same as in other breeds, except for a 10% registration of dun coats, which is high compared to other horses.

In eighteen of our forty-eight states, which account for about half of the area of the country, there is a carpet of great wealth covering the ground. It is fine, most-of-the-year forage. To convert this to man's use it must be turned into flesh; steers and sheep do this willingly. To manage these animals neither a car nor an airplane can be used effectively in the rough country. For this work the Quarter Horse and his offspring will continue to be indispensable as long as the hills endure.

*Raymond Hollingsworth.*

A FENCE is a wall around a field. Its chief function is to keep your animals in and your neighbor's animals out. It may be a thing of beauty or an eyesore; it may be permanent, semi-permanent, or just enduring enough to last until you can get your wheat crop cut.

The construction and maintenance of fences are major farm jobs. Anything to lighten this job is as welcome as a rain on a hot August day. That's why the application of electricity to the fence situation has caught on with farmers. It does keep your stock in and keeps intruders out.

On the other hand electric fence is not, nor was it intended to be, a universal fence. It approaches that in some cases but it can never take the place of a permanent line fence, it is certainly more functional than beautiful and it requires attention from time to time.

It has the faults of all mechanical gadgets and it fails at times for the same reasons that your automobile or tractor fail at times; it won't turn a sheep in full fleece unless he's been educated to it, and it is not wholly successful in very dry weather.

But when its good points are weighed against its shortcomings the vote nevertheless goes heavily in favor of the electric fence. The main thing is to understand its limitations and then go ahead from there to use all its fine advantages as a farm tool.

### The Controller

John H. Wilson of Mukwonago, Wisconsin, is typical of the modern farmer to whom the electric fence controller has become an important farm tool. His 160 acre mechanized farm employs such up to date equipment as an electric barn cleaner, silo unloader, Seaman Rototiller, three tractors and a new ultra modern milk house. All of his fences are completely electrified—have been since 1936. His 60 head of Holsteins, 13 purebred Belgian horses and Poland China hogs are quite content to stay away from the charged wire. He sums up what he thinks of electric fencing in these words:

"We'd find it hard to get along without our electric fence. It's the field separating and management tool that works best with mechanized farming."

According to U. S. Bureau of Census figures the average production of electric fence controllers has been over 400,000 units annually since 1942. The combined controller and accessory dollar volume is approaching the $12,000,000.00 a year mark.

How well the electric fence serves the farmer centers around his understanding of how to choose and operate the controller, because most failures can be

# The Controller is the Key to the efficient Operation of your Electric Fence

traced to controller mismanagement. The ready acceptance of electric fencing immediately following its first commercial appearance in 1934 resulted in upwards of 200 different makes of controllers by the end of 1938. The same claims as to safety, effectiveness and dependability were made for all of them in spite of the fact that the wide range of prices (from $1.95 to $40.00) indicated that not all of them were of equal quality.

It is little wonder that the average farmer experienced difficulty in determining which of the many controllers available was the right one for his job. Considerable uncertainty still exists in the minds of many farmers—thousands of disappointments occur every fencing season because the equipment being used is not right for the job. Understand controllers and you'll understand what your electric fence can and cannot do.

### Types of Controllers

Electric fence controllers may be divided into four distinct types:

No. 1—6-volt Battery Type

No. 2—Combination Highline or Battery type

No. 3—Rectifier and Condenser Type. (Two types—(a) maintains constant potential on fence; discharges when fence is contacted (b) has trigger tube and transformer which delivers intermittent shock.

No. 4—Alternating Current Type

The effectiveness of each type is determined by the kind of shock delivered to the fence. Since the principal cause of electric fence failures is current leakage, or shorts, (resulting from vegetation touching the wire, moisture on insulators or posts, cracked or broken insulators, etc.) the most effective type of controller is that which will stand the greatest amount of leakage and still retain an effective shock on the fence.

An important fact to be kept in mind is this: the extent of leakage on a fence is in direct proportion to the voltage used. On the average fence there are bound to be leakage paths to the ground. The higher the voltage output of the controller the greater the leakage will be. Compare the fence to a leaky hose—as the water pressure is increased, the loss through the leaks becomes more serious. On any electric fence, voltage is the pressure—if it can be kept to a minimum the leakage will be proportionately less serious.

The voltage outputs of the four types are:

No. 1—6-volt Battery Type: A high voltage output is inherent with this inductive discharge type. Peak voltages of battery controllers range from a mini-

**IF A FENCE will hold a goat it will hold anything. A preliminary lesson to teach respect for the wire will eliminate most of the trouble with breaking out.**

mum of 8000 volts to as high as 30,000 volts. For comparison, look at precautions taken to prevent leakage on the ordinary rural distribution line—covered wire, skirt insulators, wooden pegs and cross arms. Yet the voltage carried on these lines is only about 2200 volts. Obviously then, the high voltage outputs of battery controllers are subject to heavy leakage on the average farm fence. This is a good type for farms not supplied with highline current and for very distant fields.

No. 2—Combination Highline or Battery Type; The voltage output of such controllers is identical to that of battery controllers, since combination controllers are merely battery controllers equipped with power packs to permit them to be operated from the highline. The best place for this is on a farm where the controller is operated from a highline part of the time and from a six-volt battery part of the time. This is not always practical.

No. 3—Rectifier and Condenser Type: There are in reality two types of Type 3. One type consists of a simple rectifier circuit and condenser and maintains a constant potential on the fence and discharges when the fence is contacted. The second type also consists of a rectifier and condenser, but in addition has a trigger tube and transformer which delivers an intermittent shock to the fence. Both these types are different from the alternating current type (No. 4) which delivers single wave impulse to the fence. No. 3 units operate entirely from 110-volt alternating current, but deliver a capacity discharge to the fence which is quite similar to the inductive discharge of battery controllers. Apparently this type was developed to provide an inexpensive highline controller. In effectiveness it compares with the battery type rather than the highline type.

None of the three above mentioned types of controllers are suitable for extensive fencing but they do a good job on relatively short, well insulated fences. Some of the first type controllers are made with what the trade calls "a large capacitor." They can deliver a severe, high voltage shock. They are not recommended.

No. 4—Alternating Current Type: These controllers, of which there are several brands, operate from 110-volt alternating current exclusively. They differ from combination and tube type controllers in that they actually deliver alternating current to the fence. The highline current is transformed, by means of specially designed transformers, to safe proportions. The voltage is increased just enough to provide the necessary pressure and the amperage is reduced to make the shock safe.

The voltage delivered by this type of controller rarely exceeds 2000 volts R. M. S. value (the electrical engineer's terminology for average alternating current voltage value). The other types, mentioned above, deliver outputs in excess of 8000 volts peak voltage. It is because of these relatively low-voltage outputs that the alternating current type controllers will sustain more leakage than the other types.

Consequently, the farmer who plans rather extensive use of electric fencing will find the alternating current type controller much more satisfactory—the shock is more effective and less susceptible to leakage than the shock of the other types. The drawbacks are that the controller is not portable and must be installed indoors near the power source. It is higher in price.

The cost of operation of such controllers rarely exceeds 10 to 15 cents per month, even if they are used 24 hours a day.

DANGERS: *Under no circumstances should home-made highline devices be used.* Each year such contrivances are responsible for the deaths of 10 to 14 persons and hundreds of valuable animals. Recognized authorities the country over have warned against the use of unsafe equipment. It's the home-made gadget that has given the electric fence its bad repute as an executioner of humans and animals.

Prof. D. E. Wiant of the Agricultural Engineers Dept. of Michigan State College in a bulletin issued in 1944 says: "Electric fences of a safe type and properly installed have demon-

**THIS NEW TYPE of electric fence post holds firmly in the ground, insulators can be quickly fitted, and it can be easily moved. Excellent for supplementing existing fence.**

**EVERY FARM has a tough guy like this who will go through or over the stoutest fence. One taste of an electric shock teaches him profound respect for man-made barriers.**

strated their worth in efficient farm operation. Take no chance with home-made electric fence equipment. To prevent needless tragedies or loss of valuable livestock it is imperative that farmers install only equipment that is known to be safe and bears a National Underwriters' Seal of Approval."

C. L. Hamilton, Agricultural Engineer of the National Safety Council, in an article published in the Farm Safety Review, said: "The simple precaution of selecting an approved fence controller will eliminate needless tragedies and loss of valuable livestock. Low cost should not be the determining factor because unsafe equipment is cheap to build. Even well manufactured equipment must be used carefully and installed correctly with adequate grounding and protection from lightning. Reputable manufacturers are trying to make their equipment as safe as possible, and provide a fence that will restrain livestock."

The National Bureau of Standards has established regulations for electrically charged fences and the Underwriters' Laboratories, Inc. has established rigid construction standards for controllers.

Paragraph 610, Section 61, of the National Bureau of Standards "Safety Rules for Electric Fences" requires identification of electric fences as follows: "Any electric fence or portion thereof installed along a public highway or as a property-line fence shall be identified by approved markers or signs clamped to the fence wire or fastened to posts at intervals not greater than 200 feet." Few, if any, animals can read the signs; they are for the protection of literates only. To protect your livestock, install the proper controller and check it frequently.

The approved markers are 4" by 8" yellow signs with "ELECTRIC FENCE" printed in black on both sides in letters of not less than 1" in height. Observation of the thousands of miles of electric fence lines adjacent to public highways without such identification indicates that this ruling is almost completely ignored.

**Signalling and Control Features**

Most of the better controllers are equipped with signalling devices which enable the user to determine the condition of the fence, and control features which enable him to select the proper shock output for varying weather conditions.

Of the various signalling devices the most widely used are the short meter, the single light bulb or a series of three or four neon bulbs. While the short meter or the series of neon bulbs are quite accurate in indicating degrees of leakage the single light is generally intended to indicate whether or not the controller is operating —degrees of leakage, other than dead or almost dead shorts, will have very little effect on the single bulb.

In addition to signalling devices built right in the controllers there are several types of portable testers. They are handy to carry when checking fence lines for shorts because they make it possible to test the fence without returning to the controller.

Some of the testers available consist of one neon bulb which indicates the degree

THE BACK PORCH is a good place for the controller. Here it is convenient for adjustment and inspection, handy to the power outlet, and protected from the weather.

EDUCATED TO THE WIRE, these hogs may be tempted but they won't break through. Lower wire can be moved to the third insulator for small pigs. Both wires are charged.

of leakage by the intensity of the light. Another type, consisting of a series of neon bulbs, indicates degrees of leakage by the number of lights failing to flash.

All such portable testers are equipped with insulated wires of sufficient length to reach from the fence wire to the ground. When the spiked end of the wire is pushed into the ground and the other end is touched to the wire, the flow of current actuates the tester.

Changing the shock output to conform with varying weather conditions is accomplished by tapping the transformer at the required points. Some controllers are equipped with two fence terminals—one for normal weather use and the other for dry weather use. To change the shock characteristics on the fence the user must disconnect his fence from one terminal and connect it to the other.

Other controllers have built-in selection switches which permit the user to change the shock characteristics simply by manipulating the switch.

In many cases the fence terminals or switches provide two stages of operation —*normal* and *dry*. The normal setting is to be used during periods of normal or average moisture while the *dry* setting delivers a higher voltage shock designed to overcome the resistance of dry ground.

Some controllers provide a third operating stage called *wet*. The possibilities of current leakage are greatest during wet weather when the posts, insulators and vegetation touching the fence are wet. As pointed out earlier in this article, current leakage on a fence is in direct proportion to the voltage used—the higher the voltage the greater the leakage. So the *wet* settings of these controllers deliver relatively low voltage-high current shocks to the fence designed to keep leakage at a minimum. During wet weather the contact resistance of animals is also low so high voltage is unnecessary.

### Location of Controller

If extensive use of the electric fence is contemplated on the farm, a permanent controller installation should be made in some convenient or central location where it will be easy to observe its operation, and make any necessary adjustments and tests. As with any piece of electrical equipment, the controller should be located in a dry, clean place. The milk house is usually very damp, and therefore, is not a suitable place. The grainery is usually extremely dusty, and likewise would not be suitable. The thing to remember is that this instrument will be affected by dampness, dust and ammonia fumes that are frequently found in cattle barns.

A machine shop, work shop, or even the back porch of the house, if properly protected, are suitable places. If the unit is a 110 volt AC type, it should be hung in a location that is convenient to a light socket.

If the controller is to be located in one of the buildings and the fence is some distance away, the lead wire may be ordinary

galvanized wire or insulated telephone wire, whichever is available or preferred. The wire should be carried overhead to keep it out of the way of trucks and wagons. Of course, it should be fastened to poles or buildings by means of insulators. Wherever the wire passes through walls or partitions, porcelain tubes should be used.

Posts along the lane can be used for carrying the wire out to a distant field. The ordinary, well designed controller will easily handle 15 or more miles of fence. In most cases the mileage required to reach and fence a distant field will be well within the capability of the controller.

Where fields are quite inaccessible or some distance from the home farm, a portable battery controller may be used to advantage. Such units are usually weatherproof and many of them provide ample space for hot-shot batteries right in the cabinet. If time permits it is well to build box-like shelters in which to house the unit. Such shelters protect the equipment from damage by livestock as well as from the elements.

### Installation of Controller

For best results follow the installation instruction furnished by the manufacturer. All of the suggestions made by the manufacturer are designed to produce the best possible results from the controller.

It is not advisable to use lightning rods, telephone or electric service grounds, or water pipes, for a ground rod. The ground rod is important and should be installed correctly; it should be at least a ¾" galvanized pipe or rod and should be driven to the necessary depth to reach permanent moisture level. If a rod 6 to 8 feet long is driven full length into the soil, a good ground is generally assured. Drive the rod as close to the controller as possible, and when connecting the wire from the ground terminal on the controller to the ground rod, be sure that all connections are tight. It is desirable to solder the ground wire to the ground pipe, but if this is not possible a good, tight clamp should be used. If a loose connection is made here, the value of the ground rod is greatly diminished.

All of the controllers manufactured by reputable companies are furnished with a heavy duty, specially designed lightning arrester. They are not the variety that can be purchased generally at electrical or dime stores, but are especially designed for this particular job. They should be installed on the sides of the building at a point near the ground rod. This arrester will prove an effective means of grounding any charge that might build up on the insulated fence wire, should lightning strike in the vicinity of the fence. Most highline operated controllers are equipped with one ampere fuses designed to protect the controller from heavy surges of current coming in from the power line.

Experience has shown that the electric fence is safer during electrical storms than woven wire or barbed wire fences because animals trained to the electric fence will not huddle near it during storms. On occasions entire dairy herds have been killed by lightning striking the fence against which they were crowded. Inasmuch as trained stock have too much respect for the electric fence to crowd it, this danger is eliminated.

**A SINGLE CHARGED WIRE could replace the woven fence, the stout posts and the fancy yoke this bad boy wears to keep him on the reservation.**

Stories are told of animals developing so much respect for the invisible shock of the electric fence that they absolutely refuse to go beyond the fence even after the wire has been completely removed. An Iowa hog raiser tells of being unable to drive his hogs past the point where the fence formerly stood. A Wisconsin farmer once kept his dairy herd out of a woodlot simply by nailing a few insulators on the trees adjoining the pasture. Several days elapsed before the cattle discovered the absence of a charged wire.

### Construction of the Fence

In considering the construction of the fence it is interesting to note the comparative costs of woven wire, barbed wire and electric fences. The material costs were taken from the 1946 catalog of a (big) mail order house and the amount of material required was based on a survey conducted by the Electric Fence Manufacturers Association in which it was found that the average electric fence is *2.2 miles* in length.

### Comparative Costs

*47" Woven Wire Fence Topped By 1 Strand of 12½ ga. 2 pt. Bbd. Wire (2.2 Miles)*

| | |
|---|---|
| 37.4 rolls woven wire @ $15.20 per roll | $568.48 |
| 9.4 rolls 12½ ga. bbd. wire @ $3.59 per roll | 33.75 |
| 748 7 ft. steel posts @ 38c ea. | 284.24 |
| TOTAL MATERIAL COST | $886.47 |

*4 Strands 12½ ga. 2 pt. Bbd. Wire Fence (2.2 Miles)*

| | |
|---|---|
| 37.6 rolls 12½ ga. bbd. wire @ $3.95 per roll | $148.52 |
| 748 7 ft. steel posts @ 38c ea. | 284.24 |
| TOTAL MATERIAL COST | $432.76 |

*1 Strand Electric Fence (2.2 Miles)*

| | |
|---|---|
| 9.4 rolls 12½ ga. 4 pt. hog wire @ $4.07 per roll | $ 38.26 |
| 250 5 ft. cedar posts (2" diam.) @ 15c ea. | 37.50 |

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THIS SWIVEL BLADED ORCHARD SAW makes a close cut in almost any pruning position. It turns at both ends of the frame, allowing a snug cut even in the tight places. An ordinary carpenter's saw would leave a stub, which might in time cause decay. The branch being taken out here eventually would have filled the crotch and weakened the structure of the tree. Now it will develop a strong framework. Any farm girl or boy can learn to use this saw, one of the essential tools needed for the home orchard.

# Pruning and Spraying

**The care needed to keep young trees healthy and make grown ones bear bountifully**

AN INEXPENSIVE SPRAYER is a "must" if you expect to eat the fruit from your orchard rather than have the insects beat you to it. If you use hand-spraying equipment keep trees pruned low enough so they can be reached easily.

**The second article for home fruit growers by FRANK H. BEACH**

THE old Summer Pippin apple tree that stood in the back yard at Grandpa's farm blew down a good many years ago, and with it passed the old way of fruit raising. It was never sprayed and about the only pruning was done by summer storms. Yet every year just about the time that fire-crackers and Roman candles ripened it was ready too, with its fruit only gently held. Every fresh wind out of the west would bring a tattoo of sweet and juicy apples down on the roof of the summer kitchen, and Grandma's unvarying remark, "There's that drummer boy again."

Today the farmer who doesn't put on five or six sprays doesn't get much fruit. There are several theories on the cause of this. The nature gardeners say that it is all caused by the clean field farming. They say that we have destroyed the enemies of the bugs; clean fence rows and lack of cover have depleted our bird population; bag fertilizer instead of manure and compost have eliminated the protective bacteria. Other people say that the rubber-tired American has spread the formerly localized fruit pests, such as the Japanese beetle and codling moth all over the country. These are problems that will have to be answered by scientists. The fact remains that spraying is necessary and pruning is the handmaiden that makes it effective.

There are two kinds of pruning; first, the corrective training of the standard fruit tree which keeps it growing properly until it reaches a bearing age of 10 to 12 years. Dwarf trees bear earlier, at 3 or 4 years. The second type is the yearly maintenance or renewal pruning that is necessary after a tree reaches the bearing age.

It is not possible to learn *how* to prune by studying an article on pruning, but one can discover the theory and the possibilities. The best way to learn to prune is to spend a day in an orchard with an experienced tree man and watch him work. Ask him why he makes the different cuts. Then try analyzing a tree yourself and make the cuts under his supervision.

The best time to prune a tree is in the late winter or early spring. Fall pruning may seem like a good idea because other work may be light and the tree dormant. However severe sub-zero temperatures following fall pruning may cause the bark to peal, and an early or severe winter might kill the tree.

The reason for all pruning is to train the tree into a desirable shape for strong growth, complete spraying and easy harvesting. While the tree is growing and before it reaches the bearing age it should be pruned lightly. All pruning is a dwarfing process and laterals (branches that leave the main trunk) that are pruned will be delayed in bearing. So prune as little as possible while maintaining the proper training. Here are the simple rules which are the basis of all fruit tree pruning. They apply particularly to educational pruning.

(1) While the tree is small, try to develop a good lateral to the southwest, the northwest, the northeast and the southeast. If these branches are spaced up

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A USEFUL TOOL for long reaches is a pair of lopping shears; they will cut limbs too large for hand shears but too small for sawing. The long handles enable you to do more pruning from the ground. Cutting out the weak wood concentrates the tree's strength into better and greater quantity fruit production.

GO EASY pruning a plum tree. Just a few cuts will keep it sufficiently open. With a little experience you can learn to judge the difference between bearing and non-bearing wood. Eliminate the older, underhanging wood. On this tree a covey of water sprouts was trimmed away from the base, to open it up.

HAND SHEARS are best for removing small branches. Place the blade side of the shear snugly against the main limb, to make a smooth cut. For easy cutting bend the branch over the jaw of the shear while cutting. Don't wiggle the shear through the branch; it will leave a rough wound, an easy opening for insects.

CHERRY TREES TOO should be pruned moderately. This five year old Montmorency has a good shape. It has been well cared for each year. It took only 10 minutes to prune this tree; care was taken to remove branches entirely rather than just cut them back. Cutting cherry branches back stunts their growth.

BEFORE. Two important points to remember in pruning a peach tree are: keep an open center, and, thin out the rest of the tree. A peach tree bears on wood that grew the previous year. This Elberta is too dense in the center. To encourage the renewal of fruiting wood it will be opened and thinned.

AFTER. The center branches were removed; then about one third of last year's growth, mostly spindly branches, were taken out. Peach trees are pruned heavier than other fruit trees to give the bowl shape. Some of the lower limbs were cut away because they were no longer productive and made cultivation difficult.

BEFORE. This young Cortland apple tree needs only a light pruning. There are some sling-shot crotches to cut away; all of the water sprouts around the base of the tree should be cut off. The lower limbs should be spaced up and down and around the trunk to make strong, wide angle crotches.

AFTER. When the pruning is completed there has been no shortening of the remaining branches. For early bearing these must grow naturally to give a good distribution of fruiting wood over a long length of limb. Light annual pruning has made this a strong tree, and it should have a long bearing life.

BEFORE. This Stayman Winesap has become too tall for easy care: it must be lowered to a height that will make spraying and picking easier. Although height is best controlled with annual pruning, this tree can still be given a desirable shape. Tall, upright branches will be cut back to strong laterals at the height indicated by the line.

AFTER. The height of the tree was lowered about 8 feet. Now a small home sprayer with an extension rod will reach the top branches, and the fruit can be picked from a ladder. Water sprouts that cluttered the center of the tree were cut away. In following spring, slight annual pruning will keep this tree under control.

and down the main trunk they will give the tree a good balance.

(2) Train the top of the tree so that the main trunk is somewhat higher than the side branches. Then train the trunk by cutting it back to an outward growing lateral at a height of about 8 feet. This will cause the tree to open int the desirable bowl shape.

(3) Remove all limbs within a foot of the main trunk that arise from laterals.

(4) Remove all limbs that grow across the center of the tree. This will allow better light penetration, and make spraying and picking easier.

(5) Remove the weaker of the two limbs where they form a "V" crotch. Sooner or later the tree will split at this point if the crotch is not eliminated.

(6) Don't allow large branches to grow parallel if they are closer than 4 feet.

(7) Make the pruning cut clean and flush with the branch. If the cut mark is larger than a quarter, paint it with antiseptic tree paint.

(8) Don't allow a standard tree to become taller than 20 feet, nor a dwarf tree taller than 8 feet. You can stop the upward growth by cutting the upright top limbs back to strong laterals.

After a tree reaches the bearing age it will require only maintenance pruning. If it has not had the benefit of early corrective training it will be necessary for you to get your saw and shears and try to correct it along the lines of the 8 rules which have been given above.

Maintenance pruning keeps the tree from becoming too tall or too dense for proper spraying and harvesting. These rules are basic:

(1) Prune off all the dead, diseased and broken limbs.

(2) Remove all weak and underhanging wood. The wood that grows on the underside of laterals is usually referred to as "weak wood." It may be less than lead pencil size though it is 4 or 5 years old.

(3) Try to keep as much young bearing wood as possible on older trees. Learn to identify it.

(4) Prune only to strengthen the tree. If a bad "V" crotch develops remove the to identify it.

(5) The one type of mature tree that requires extensive pruning every year is the peach tree. It bears *only* on the previous year's growth. So, cut to keep the center of the tree open so that the new wood will predominate. Cut out the weaker of last year's branches to give better spacing. If good wood is kept spaced along the laterals the fruit crop will be larger and of better quality.

Every county agent has pruning bulletins which elaborate on the pruning points given here. He will give you the approved pruning details for your state.

### The Spray Program

The two basic considerations for a spraying program are: (1) get the recommended spray on at the right time and (2) make a thorough application. If you're counting on using a neighbor's sprayer you will probably be either too early or too late with your sprays, for he will be using the sprayer at the right time. A small hand or power operated sprayer is a good investment. The hand model will cost you around $30 if it is on wheels, and a power model will cost about $150.

Timing of sprays requires the same nicety of observation and common sense as knowing when to cut hay. There are

(Continued on page 130)

THIS FOUR YEAR OLD Apple tree is being fertilized with Nitrate of Soda. It is spread over the mulch or grass, starting one foot from the trunk of tree and extending outward to the edge of the branches. Any high nitrogen content fertilizer may be used, the rate of annual application being about ¼ lb. per year of tree age. Chicken manure may be used, but with caution; it has a very high nitrogen content.

# SPRAYING PROGRAMS FOR HOME ORCHARDS

Suitable for use in Eastern and Middle-Western States

In these sprays the following abbreviations are used:
T — 1 level tablespoon  C — Measuring cup or ½ pint  t — 1 level teaspoon

## FOR APPLES* AND PEARS

| Spray No. | Time to Apply | Materials | Amount to use per gallon of spray | Diseases and insects to be controlled | Remarks |
|---|---|---|---|---|---|
| 1 | When trees are dormant (no leaves) | Oil Emulsion (3%) | ½ c. | Scale<br>Red Mite | Necessary only when these pests are troublesome |
| 2 | Just before bloom | Dry lime-sulfur | 4 T. | Scab | Very important for apple scab |
| 3 | When most of flower petals have fallen | Wettable sulfur<br>Lead Arsenate<br>Lime | 5 T.<br>3 T.<br>5 T. | Scab<br>Curculio<br>Codling moth<br>Canker worm | Very important |
| ** 4 | 3 weeks after petal fall | *Same as above* | *Same as above* | *Same as above* | Important for codling moth. Best to check with county agent where this pest is bad. He may recommend use of 50% DDT powder in sprays and using 1½ T per gallon of spray. |
| 5 | 5-6 weeks after petal fall | *Same as above* | *Same as above* | Apple maggot<br>Codling moth<br>Scab | |
| *** 6 | 9-10 weeks after petal fall | *Same as above* | *Same as above* | *Same as above* | |

*For early ripening varieties of apples, sprays No. 5 and 6 are not needed.

**In areas where the apple diseases Brooks Fruit Spot, Blotch, and Bitter Rot are a problem, substitute Fermate or commercial Bordeaux Mixture at manufacturer's directions or homemade Bordeaux prepared as directed by your Agricultural Agent, for wettable sulphur sprays 4, 5 and 6.

***No. 6 is not usually needed on pears.

## FOR PEACHES AND PLUMS

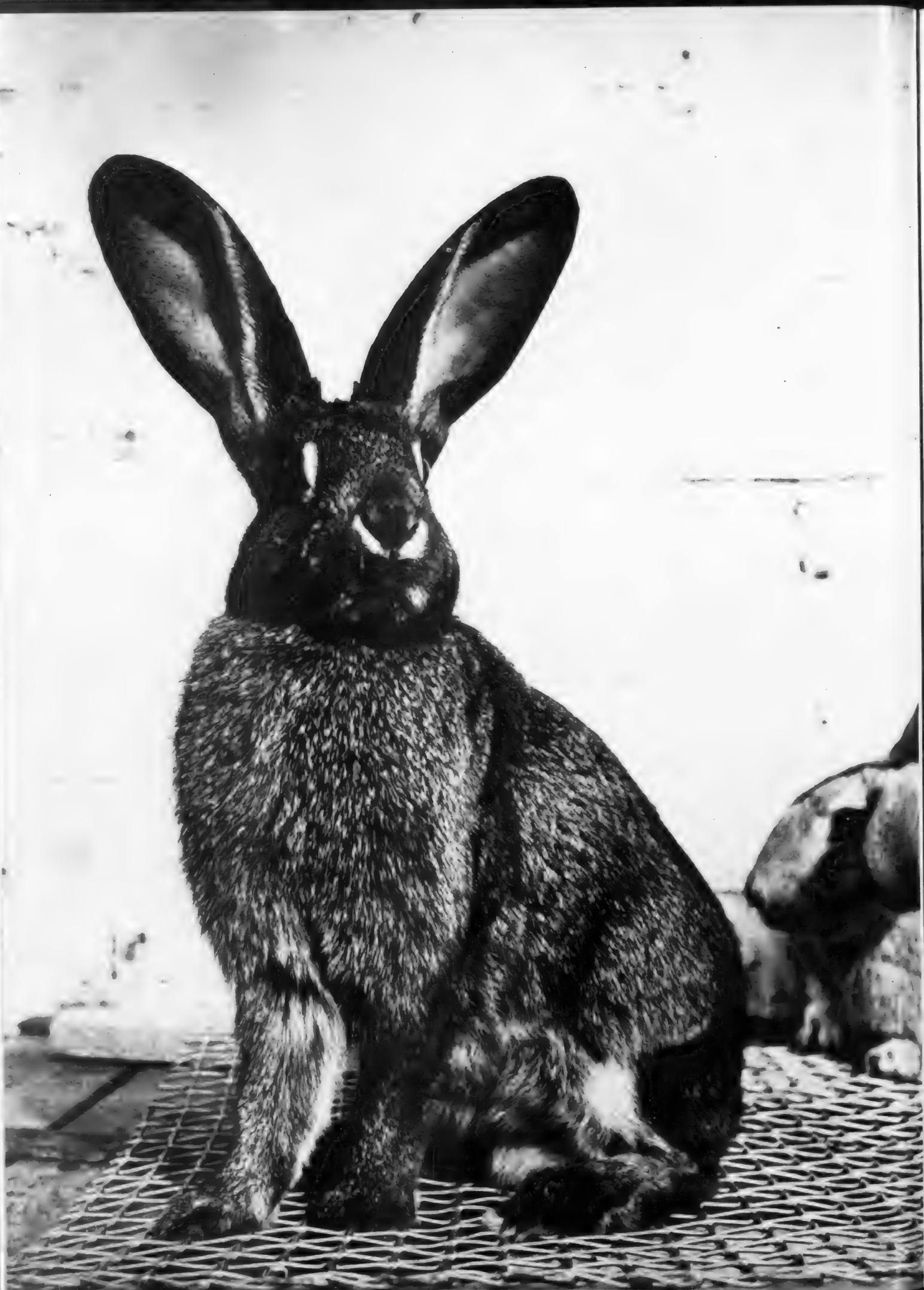
| Spray No. | Time to apply | Materials | Amount to use per gallon of spray | Diseases and insects to be controlled | Remarks |
|---|---|---|---|---|---|
| 1 | When trees are dormant | Dry lime-sulfur | ½ c. | Peach leaf curl | If scale is present, double amount of dry lime-sulfur |
| 2 | Just before bloom* | Wettable sulphur | 6 T | Brown Rot | Important for curculio control |
| 3 | Shuck-fall or one week after petals have fallen | Lead arsenate<br>Zinc sulfate<br>Wettable sulfur<br>Lime | 2 T.<br>5 T.<br>5 T.<br>5 T. | Curculio<br>Brown rot<br>Scab | Important for curculio control |
| 4 | Three weeks before harvest | DDT (50%)<br>Wettable Sulphur | 2 T<br>5 T | Oriental moth,<br>Brown rot, scab | Important for scab control |
| 5 | Five days before picking peaches | Wettable sulphur | 5 T. | Brown rot | Important for brown rot control |

*Peach tree borers* are the peach tree's most serious pests. They tunnel between the bark and the wood of the crown, trunk, and upper roots of the tree. Peach tree borers are controlled by applying crystalline paradichlorobenzene (PDB) in a ring around the trunk about October 1. Three-fourths ounce of crystals to a well grown tree is placed in a ring two inches from the base of the tree and covered with soil. Care must be taken not to place the chemical in contact with the tree. DO NOT USE THIS TREATMENT ON TREES LESS THAN THREE YEARS OLD. Where only one or two trees are infested the borers may be removed with a wire or knife.

*Repeat 2 weeks after spray No. 3 and again 5 weeks later for Brown rot control.

## FOR SWEET AND SOUR CHERRIES

| Spray No. | Time to apply | Materials | Amount to use per gallon of spray | Diseases and insects to be controlled | Remarks |
|---|---|---|---|---|---|
| 1 | When buds are in delayed dormant (sweet cherries only) | Dry lime-sulfur<br>Nicotine sulfate | ½ c.<br>1 t. | Black cherry aphis | Use only when black cherry aphis is troublesome |
| 2 | One week after petal-fall | Wettable sulfur<br>Lead arsenate<br>Lime | 5 T.<br>2 T.<br>5 T. | Curculio<br>Leaf spot<br>Brown rot<br>Slugs | Important for curculio and leaf spot |
| 3 | Four weeks after petal fall | Wettable sulfur<br>Lead arsenate<br>Lime | 5 T.<br>2 T.<br>5 T. | Leaf spot<br>Maggot<br>Slugs | Important for leaf spot |
| 4 | Spray sweet cherries after each rain period until harvest | Wettable sulfur | 5 T. | Brown rot<br>Leaf spot | Very important if brown rot is hard to control |
| 5 | Immediately after harvest | Wettable sulfur | 5 T. | Leaf spot | Necessary only if leaf spot is a problem |



# RABBITS

By GEORGE LAYCOCK

**Rabbit Raisers can't turn out Meat and Fur fast enough to supply the Market. A small capital Investment gets You started.**

THE domestic rabbit, once the chief delight of the juvenile hobbyist and a cute present for the kids at Easter time, has come up in the world in recent years and has made poultry and other meats move over and make a place for it on the dinner platter. The domestic rabbit's popularity as a food supply came during the war years when beef and pork were scarce and housewives gladly settled for anything called meat. They found that the family liked the white meat and they soon got the habit of varying the beef-pork-chicken menu with an occasional rabbit.

A typical experience of a meat-rabbit raiser is that of Henry Culp of Hilliards, Ohio, who kept rabbits during the first World War. He made a go of it too, until prices fell so low that he could make no profit on his feed and labor. He went back to raising rabbits during World War II, however, and now has a herd of about 600 from which he sells dressed fryers every Friday at 60 cents a pound. Even with the high costs of feed this is an 80 cent profit from the meat and fur of every fryer he sells. "You just can't do that good with poultry," Henry says, and he should know for he also has a flock of 1000 white rocks.

Rabbits aren't hard to raise. A dozen of them require about 15 minutes a day for feeding, and an extra half hour on Saturdays for pen cleaning. They don't take a lot of space, and the demand is for more than growers can fatten out. The meat is nutritious, and when properly cooked can take its place as the main dish in any dinner. The meat is all white and tender because the rabbit gets little exercise. There are no wings, and even the tail piece is full of solid meat.

In England, rabbits are raised to maturity to get the prime pelt, and the Britishers must settle for an older and usually tougher rabbit. Americans, typically, care little about these extra pennies for the pelt and say, "Give us tender meat." Here rabbits are killed at two and three months to be sold as fryers. The rabbit raiser has two basic products to sell, meat and fur. He sells the meat at the right age and makes what he can from the fur.

Rabbit fur has a ready market. Income from fur makes few millionaires, but it does go a long way toward paying feed bills. Sixty-five per cent of all fur used in America today is peeled off rabits. Most of the prime fur goes into ladies coats, while the inferior pelts are used for hat felt and glove linings.

The person who wants a self supporting hobby, or is looking for a way to keep his boys too busy to throw rocks through windows, should give a thought to rabbits. The very young and the very old can do all the required work. Rabbitries range from small ones for the family meat supply to full time jobs with herds of 1000 to 1500 head. It is possible for a person with a two acre lot to keep 150 breeding does and realize an annual net profit of $2,250.

### Under $100 Sets You Up

You can start in the rabbit business

**ONE WAY TO GET A NEW FUR COAT** is to marry the man who raises the rabbits. This attractive coat was made of undyed fur grown on the farm where the owner lives.

←

**IF PERSONALITY RATED** points this chinchilla buck would be a blue ribbon champ. Although his fur is off color for his type, he is still a valuable meat animal.

with good stock and suitable hutches for less than $75.00. Breeding stock will cost from $8.00 to $15.00 a head. A house of six well-constructed hutches should cost less than $25.00, if built at home, and a stock of feed will run another $6.00 or $8.00.

From the sale of meat and fur you can expect a return from your first trio of $55.00 to $60.00 the first year. Each doe worth her pellets will, on the commercial basis, produce four litters a year and average six to the litter. The female rabbits from your two does' first litters will mature in time to raise litters of their own the first year. The person who starts with a few head can soon have a sizable herd, for rabbits multiply like all get-out. You go to bed at night with three rabbits and wake up in the morning with thirty. From then on it keeps you busy building hutches to stay ahead of them.

The center of the American rabbit industry is in Southern California. In this state, where everything comes in colossal proportions, domestic rabbit places third in meats consumed. Rabbit eating during and since the war has risen sharply all over the country. Rabbits can be raised in any part of the country, either indoors or out. Their houses are simple to build and need no heat.

### The Breed You Choose

There are about 50 recognized breeds of rabbits. It is best for the beginning rabbit farmer to select one breed and stick to that one until he understands rabbits and their troubles. There are only about half a dozen breeds of commercial importance in this country. The other forty-odd are for the hobbyist.

### New Zealand Whites

When the rabbit was elevated from the show class to a commercial basis the New Zealand White began to grow in popularity. One big advantage of this rabbit over colored breeds is his coat, a pure white one, which will take even light shades of dye. The fur from white rabbits brings the highest prices on today's market. On a recent fur price list the offer for an extra large number one white fur was $1.10 to $1.25. He is a compact animal, broad and meaty any way you look at him. He is an ideal meat rabbit for he can easily be fattened out to weigh four pounds at eight weeks.

A mature white New Zealand buck will weigh in at 9 to 11 pounds, and a female will push the scales to 10 to 12 pounds.

The fur should be soft in texture, but not wooly. It should feel gritty to the fingers, for this indicates a good coat of guard hairs which makes it wear when it becomes a coat. The fur should have what is called "fly-back." Check for this by running your hand from the rear quarters to the shoulders and see whether or not the hair flies back into place. Fur buyers look for this when they are buying prime furs for women's coats. The undercoat, that layer of fur beneath the guard hairs, should be heavy and softer than the guard hairs. The whole coat should be about an inch and a quarter long.

### New Zealand Reds

The popularity of the New Zealand Red began to suffer when higher prices were first paid for white furs. This red cousin of the White is, however, a hardy, prolific rabbit that is one of the best meat producers. He has a medium length body in contrast to the stubby body of the White.

Rich, reddish, buff colored fur covers this rabbit, making him a beautiful animal. His red coat, however, is his one big drawback for it lacks flexibility in dyeing. An extra large prime No. 1 red fur is worth about 90 cents, or 35 cents less than a white one of similar quality.

### Chinchilla

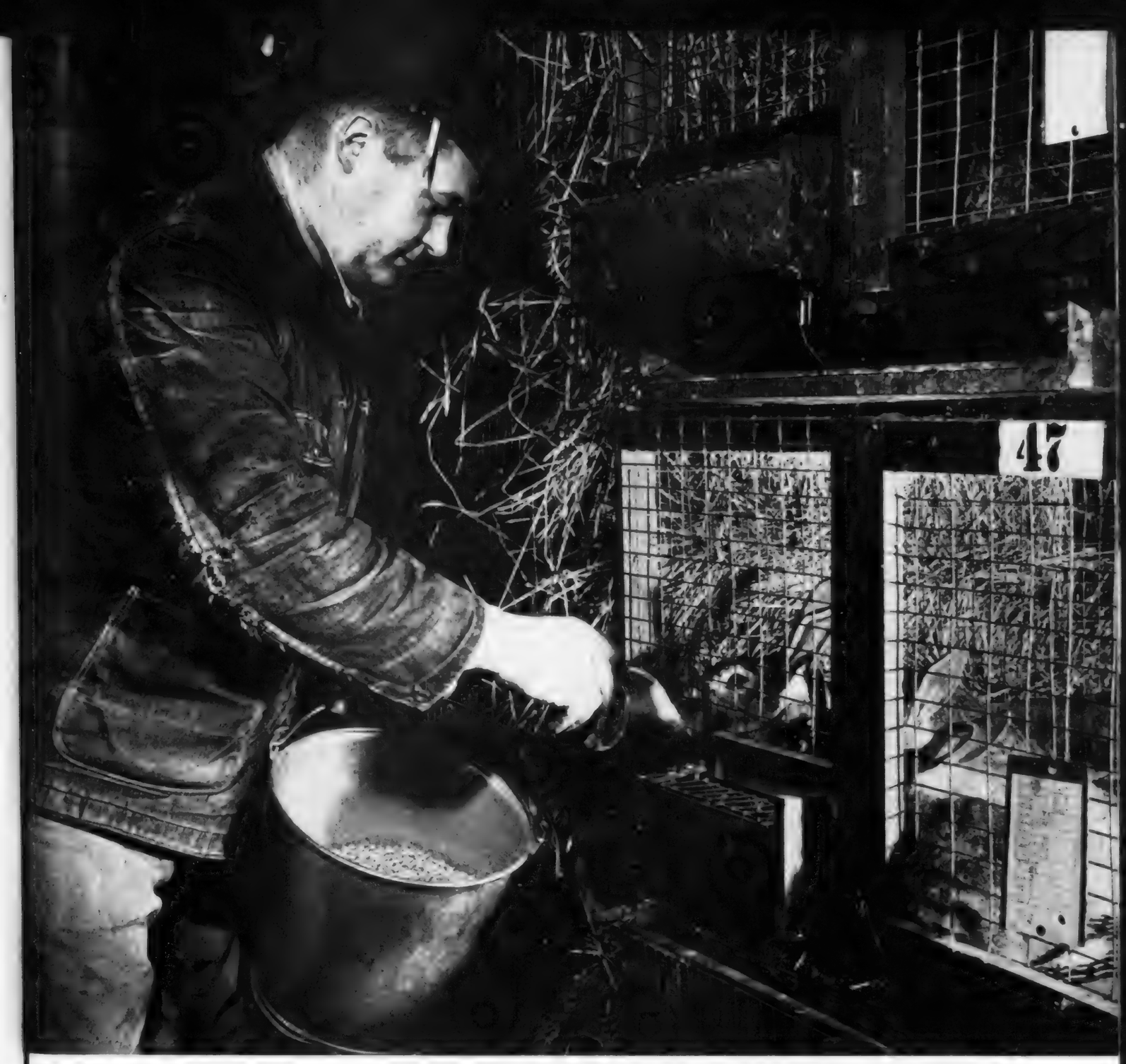
Perhaps our second most popular commercial rabbit is the chinchilla, which comes in three weight classes: standard, heavy weight and giant. The standard weight buck weighs less than 7½ pounds, and the doe can go half a pound heavier. The heavy-weight, which by the way is a good all-around dual purpose rabbit, reaches weights of from 9 to 11½ pounds for the doe and 8½ to 10½ for the bucks. The giants are large rabbits that weigh anything above the maximum for heavyweights, and often grow to 14 or 15 pounds.

The chinchilla rabbit has an attractive bluish gray fur that usually runs second in value only to white. A No. 1 extra large chinchilla fur is worth only about ten cents less than a similar grade white fur, providing the market to which you ship your furs keeps chinchilla furs separate. If you raise chinchilla rabbits, shop around for a market that buys its chinchilla fur separate from the other colors, otherwise your price for all furs will be based on the lowest grade.

The fur of a chinchilla should be from one and a quarter to one and a half inches long. Check this rabbit's fur for good density. Blow into the fur and note whether or not you make a deep funnel-like hole in it. If the fur spreads out larger than a silver dollar, the coat is too thin. When you rub your hand over his back, from tail to neck, the hair should settle gradually back into place. Check the chinchilla's fur for the needed guard hairs and satisfy yourself the fur isn't silky or wooly.

This rabbit is a stocky animal with a broad compact body. From above, his contour should be nearly square, with the hind quarters a little broader than the

APPARENTLY CONFIDENT that he won't be dropped, this rabbit sits snugly in his owner's left hand. The right hand firmly grasps the roll of fur behind the neck. This is the best method of handling large rabbits without injuring them.




**THE GOOD HUTCH is dry, clean, free from drafts, and easy to service. In a well-managed rabbitry the pens are numbered, the rabbit's history briefed on hutch cards, and the feeding and cleaning are done from the outside.**

shoulders, but not enough to make him look wedge shaped. He has a solid flesh that makes good eating. The chinchilla has been in the United States only about a quarter of a century but in that time he has become one of our leading rabbits for both show stock and commercial herds.

### Flemish Giant

Large strong bodies and straight powerful legs characterize the Flemish Giant. He comes in seven colors, including steel, sandy, gray, white, blue, black and fawn. His hind quarters are large and heavy and rump is well rounded. His shoulders too, are broad, but narrower than the hind quarters. A good Flemish Giant has ears that aren't lazy, but stand long and erect.

This rabblt is a heavy animal, weighing 12 to 16 pounds at maturity. This weight is one of his shortcomings, for a rabbit that weighs six or seven pounds dressed is harder to sell than a two pound fryer.

### Checkered Giant

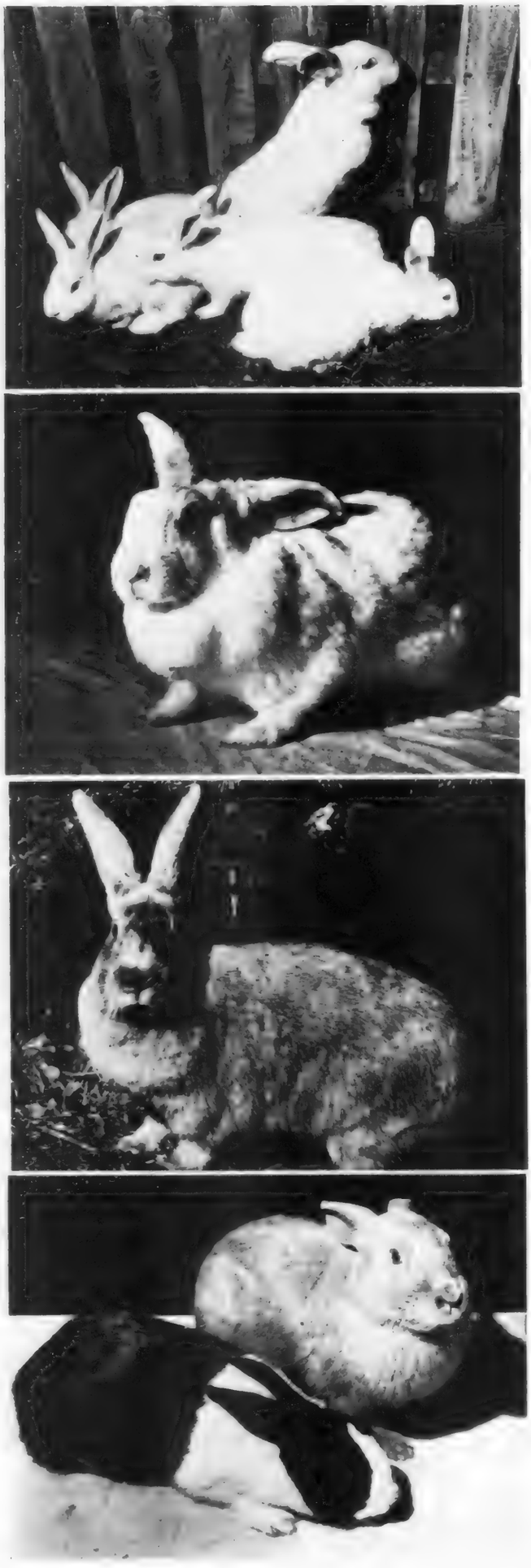
Another large rabbit is the Checkered Giant, which comes in white with a pattern of either blue or black spots on his coat. He will go to 12 and 14 pounds at maturity. To be classed as a giant, the bucks must weigh at least 10 pounds, and the does 11.

His body is long and well arched. His head is stocky but shouldn't look like that of a bull dog.

His coat is white and the markings on it cover his nose, eye, ears, tail, and run down the back in a continuous stripe along the spine. There are also spots on his sides, cheeks and hind quarters. To be acceptable show animals, these spots have to meet certain standards of size and location, but the fact that they are below these standards has no effect on the value of the fur or the sale of the meat.

The disadvantages of this breed are the same as those of other giant breeds with colored fur. It is often too much for a small family meal, and the color draws a discount for the fur.

These five breeds make up most of our commercial stock today. Other breeds



are raised as hobby animals and for show. Among them are rabbits that cover the whole spectrum in colors, and range the scales in size. The show animals are bred constantly toward a set of standards established by the American Rabbit and Cavy Breeders' Association. The constant striving for perfection in size, color and type helps the commercial rabbitry by developing breeding stock superior for fur and meat production.

Some of the rabbits developed for show stock have little purpose on earth other than a hobby. One breeder, for instance, has bred a chinchilla that matures at about two and a half pounds and is called a Min. Chin.

Raising angora rabbits is a separate and distinct industry. Five hundred angoras are a full time job, for they must be clipped once every 10 weeks, and kept especially clean to protect their wool from "matting." They are kept as long as they produce a good crop of hair with little thought gien to selling the meat or pelt. An adult angora will produce about a pound of wool a year, which sells for $10 to $15 a pound.

There's no magic formula to follow in selecting a breed for your start. It may come to you in a dream, you may follow the advice of a friend, or flip a coin. The choice made, you buy your foundation stock. Right here you wonder how deep to dive in. The best advice is to take it easy at the start.

A trio of two does and a buck is a good start. At the most, get no more than eight or ten does and a couple of bucks. One buck will service ten does, but it is best to have an extra buck to give you a little freedom in your breeding schedule. This modest foundation can blossom into a sizable herd within a year or so. If your herd starts small and grows, your knowledge can grow with it and better enable you to cope with the problems you'll have in feeding, breeding and doctoring.

### Select Good Individuals

Perhaps the most important step that you will take in building your rabbitry will be selecting your breeding stock. You can contact rabbit breeders through a local rabbit club, a rabbit magazine, or even from the telephone directory.

The fact that the fellow down the road raises the kind of rabbits you want doesn't mean that you should buy your breeding stock from him. If he has good stock, that is the place to buy, but first inspect his rabbits. A healthy rabbit has bright eyes, erect ears, and a smooth coat. He is fairly active and his droppings are hard and round while his vent shows no trace of diarrhea.

A rabbit that spends his day crouching in a corner refusing perfectly good food, or one that has an unusually rough coat, or a dull look in his eyes, should be passed up as a poor investment. Your search should be for animals that will live for another three or four years and give you four litters a year, with an annual average of 24 to 32 young per doe. After you have found some rabbits that look good, inspect their pedigrees for it is best to begin with pedigreed rabbits. If you start with rabbits whose history is vague, you'll likely find your hutches filled with a conglomeration of throw backs of all sizes and colors.

Good rabbit breeders keep accurate records and should have no objection to showing a rabbit's history. Note the size of litters for several generations back. If possible, buy rabbits that come from a long line of big healthy litters.

Often it is best to buy your stock young and let your experience grow with it. Newly weaned rabbits are often sold for breeding foundation stock. If you buy stock old enough to breed, however, you have some idea of how big they will get and what the mature animal will look like. In any case don't purchase over-aged rabbits and expect to get good results from them. Remember that a doe loses her efficiency after about four years, and a buck at that age begins to lose both his potency and youthful ambition.

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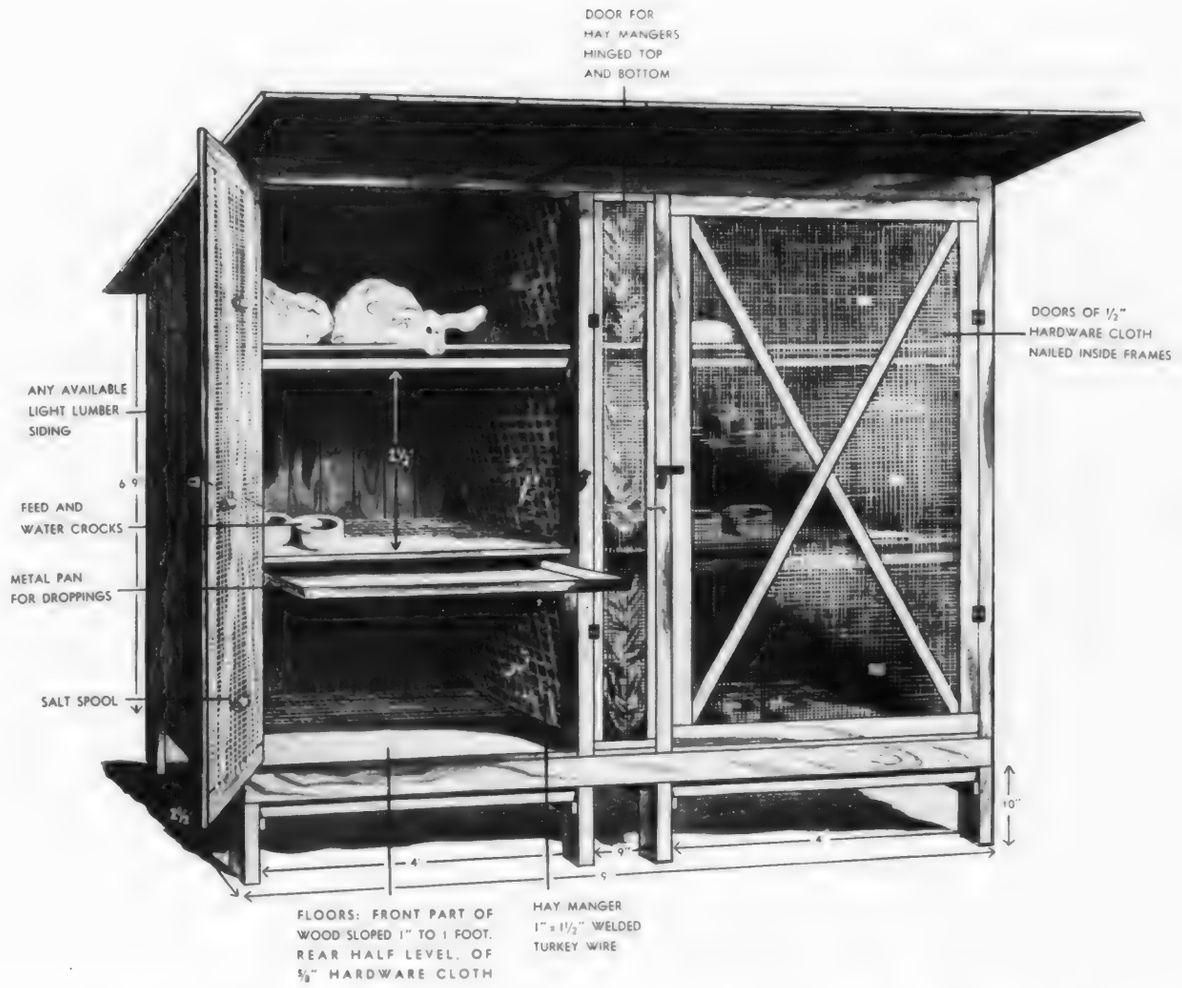
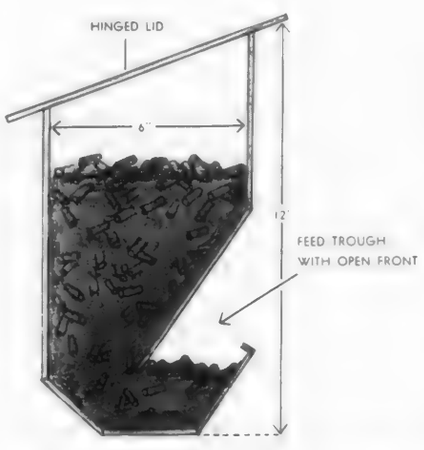
**SOME POPULAR BREEDS FOR SALE AND SHOW (top to bottom): New Zealand White doe and her family of four young; a White Flemish Giant, noted for heavy weight and good fur; a Blue Silver Fox, bred mostly for the show table; a Lilac and a Black Dutch, a fast seller as an Easter pet.**




**THE GOOD RABBIT HUTCH is a pleasant home for the animal and a chore saver for the owner. This type of hutch is excellent for the midwest and northern states for it protects the rabbits from drafts and rains, is easy to clean and simple for feeding hay since each manger feeds two pens. The front half of the floors are made of ½" or ¾" lumber and the back half is ⅝" hardware cloth. The wood part is sloped so that droppings roll onto the wire and fall through into the dropping pan. The eaves extend well over the front of the hutch to protect stock from weather. When two hutches are butted together the wide eaves protect the aisle between them. The hay manger doors are fancy extras that can be left off. The siding can be rough lumber, either tongued and grooved or snugly fitted to eliminate cold drafts.**




CROSS SECTION OF SELF-FEEDER. IT CAN BE ATTACHED TO SIDE OF PEN AND FILLED FROM OUTSIDE.

### Make a Home for Harvey

It is best not to bring a rabbit home until you can offer him the hospitality of a completed hutch, equipped with feed. Have a place to lodge him and a general idea of how you are going to care for him. This will save you all kinds of troubles that come from hastily built hutches which later turn out to be labor eaters.

A rabbit's pen doesn't have to be a castle, but it should be adequate in size, easy to clean, and one that protects its occupants from rain and drafts. As long as it meets these requirements it can be either elaborate or extremely simple.

It can be either outside or in a building. An old shed that will cut out some of the rain and drafts, and will at the same time permit entrance of fresh air and light, is ideal. It should, if possible, be ratproofed, for rats will pull a young rabbit's legs through the wire floor and chew them off. Many city people raise rabbits in their garages. Inside hutches need not be as sturdy as the ones you build out-of-doors. The plan for a six hutch rabbit house shown herewith is a simple and adequate type which is popular with many breeders.

The Government Rabbit Farm in Fontana, California, suggests that hutches for small breeds be two feet high, two and a half feet wide, and three feet long. For medium sized breeds they should be four feet long and for the giant breeds, six feet long. Few rabbit men actually have six foot hutches, even for giant breeds, but with space available the animals shouldn't be crowded into less.

### Maternity Wards

Have nesting boxes ready to set in the pen when the doe gets in a family way. These can be ordinary wooden packing crates, preferably with a removable top. They should be 14 inches wide, 12 high, and about 18 long. The doe's entrance should be six inches square and near the top so that the blind and helpless young can't crawl from the nest to die of exposure.

THIS RABBIT LOST HIS PELT at the hands of an expert who has learned that the pelt can be quickly and easily removed if it is cut free around the hocks and tail and peeled from the body like an undershirt.

Old nail kegs make excellent nesting boxes. The bottom half of the open end should be covered with a board which will also keep the keg from rolling in the hutch. Drill some holes in the bottom for drainage and a few in the back for ventilation.

The two crocks needed for each pen, one for water and one for grain, can be purchased at most feed stores for about 20 cents each. Get heavy ones, else they'll be knocked around.

Keep a card on the front of each hutch on which you can keep the occupant's record. For a doe, this information should include date bred, buck servicing, number kindled, and number raised. A buck should have a card showing does serviced, dates of service, and number sired for each doe.

### A Breeding Program

Rabbits are ready to begin making more rabbits when they are seven or eight months old. Before you breed young does for the first time it is wise to keep them in individual pens for a few weeks. A group of young female rabbits penned together will often sexually stimulate each other by riding. This may end in a false pregnancy which, while apparently satisfactory to the doe, adds no rabbits to the population. The young does should be separated and bred at this point, or 17 to 18 days time may be lost in this unfruitful dream of motherhood.

A doe ready for service is taken to the buck's cage. Even though a doe may yearn for a lover, she will attack him if he threatens to intrude upon her privacy. You can usually tell when the doe is ready to breed by the way she acts. She will become restless and nervous and may try to get to other rabbits. She may also rub her face on the feeders or pen. A rabbit has no regular time to come in heat, so a doe can be bred any time after she reaches 7 or 8 months.

Keep enough good herd bucks on hand so that you don't have to breed closely related animals. Inbreeding intensifies both good and bad characteristics in a rabbit and may fill your hutches with culls. Rabbits that show signs of disease should be quarantined and treated, but not used for breeding stock.

Breeding bucks are always willing, but should be used for service not more than three or four times a week. Keep them from adding too much fat by controlling the fat producing foods. Rabbits usually are easy to breed, and it's as quick as saying "Jack Robinson." Occasionally you may find a doe that is hard to breed and you may have to give the buck a bit of help. If you can't keep

(Continued on page 104)

JONES' COMMERCIAL RABBITRY

Doe's Breeding Record

| Name | Number |
|---|---|
| Gloria | E-573 |

| | |
|---|---|
| Bred | 6/4/47 |
| Kindled | 9 |
| Raised | 7 |
| Buck | Silver |

| | |
|---|---|
| Bred | |
| Kindled | |
| Raised | |
| Buck | |

| | |
|---|---|
| Bred | |
| Kindled | |
| Raised | |
| Buck | |

| | |
|---|---|
| Bred | |
| Kindled | |
| Raised | |
| Buck | |

This hutch card for breeding does provides space for the doe's record for four litters, or one year. They can be easily made from 3" x 5" file cards and one should be fastened to the hutch door.

SOME RABBIT FURS are trimmed or velvetized as the first step in making a lady's coat. The top piece is untrimmed and both are mounted on a ½" screen to show how much was trimmed off. It takes about 60 rabbit pelts to make a full-length fur coat and 40 for a short jacket. The four most common names under which rabbit is sold are: Coney, a long haired one; Lapan, which is sheared and dyed; Sealine, which is dyed black to resemble seal, and Beaverette, which is dyed brown to look like beaver. The quality of a pelt depends on full underfur, glossy outer-fur, and freedom from blemishes. Thickness of hides varies between rabbits, but it isn't important as long as the hide is thick enough to prevent tearing in processing. The U. S. imported $1,699,379 worth of rabbit fur during the first month of 1947. A large part of this came from Australia. We still supply only a small fraction of the rabbit fur we need. Lester C. Leber, of A. Hollander & Son, Newark, New Jersey, one of the world's largest fur blenders and dyers, says, "The most valuable rabbit comes from New Zealand. It is the choicest because it possesses the greatest amount of luster, silkiness, and density. In the last decade California has developed a white rabbit that is assuming increased stature. Production of skins is now up in the millions for California alone."

ROUNDWORM CONTROL begins before the blessed event with the scrubbing of the sow and the disinfecting of the farrowing house. Ascaris eggs cling to the sow's teats like burrs to a cow's tail. Warm water and soap applied with a stiff brush and plenty of elbow grease will liquidate the eggs and give the little fellows a clean start.

# Roundworms In Hogs

By BANNER BILL MORGAN

A hog that is furnishing room and board to a mess of roundworms doesn't get much nourishment out of his feed because the worms sit at the first table. The more worms in a hog the longer it will take to finish him for market and the worms may finish him first.

Roundworms are the scourge of American hog lots, the most difficult to control of all swine parasites. Most hogs have a few worms in them, even under favorable conditions, and if they once get a head start it's goodbye to profits. Even with modern medicines and a growing knowledge of how to control them, it's a wonder that they can be held back at all. A mother worm will lay 30,000,000 eggs in her lifetime.

The adult roundworm will reach a length of 12 inches and a girth as large as a lead pencil. As many as 500 worms have been taken out of one hog—enough to fill a good sized fruit jar. Even a few will delay finishing the hog for market, and badly infested animals will take from four to eight weeks longer to fatten.

Before we go into details about how to control this pest, let's take a look at the critter himself the better to undersand how he operates.

The early ancients knew about the roundworm. Moses speaks of him, and Aristotle, back in 384-322 B.C., made some philosophical observations about him. Linnaeus, the famous Swedish botanist, in 1758 gave the worm a scientific name almost as long as the parasite itself —Ascaris Lumbricoides. Vets and professors call him ascaris for short but the hog raiser couples "roundworm" with adjectives too lurid to print here.

When the worms are taken alive from a freshly opened intestine they are reddish to pink in color. In alcohol or formalin they turn an opaque white. The male worms are usually smaller than the females, the latter often going beyond 12 inches in length. The female worm is a remarkable creature and her reproductive mechanism is highly perfected. Wrapped in many tight coils inside her body is the uterus. This marvelous apparatus enables Mrs. Ascaris to lay more than a quarter of a million eggs per day. She may lay as high as 30,000,000 eggs in her short lifetime.

It is neither exhuberance nor folly for her to lay so many eggs. All of the eggs may not develop; some are destroyed by nature. However, she has succeeded in seeding the hog pens so generously with eggs that it is almost a certain guarantee that she will maintain herself in the form of the next generation. A hog, being what he is, spends a good deal of time with his snout in the mud. He'll pick up plenty.

Mother nature has provided the ascaris with infernally efficient methods of protecting her egg crop against destruction. The eggs are extraordinary. They are covered with a thick horny shell which makes them resistant to all types of weather conditions; they remain viable after long periods of exposure to freezing or drying. Eggs have been kept alive in the laboratory for 10 years, and in soil they can still infect pigs after five years. Strong chemicals, antiseptics and disinfectants have very little effect on them.

When freshly laid, ascaris eggs are covered with a sticky muscilage so that they adhere to any moist surface; they may be found on walls and floors of hog houses and pens. Ordinary scrubbing or washing will not remove them. They also stick to the belly of a brood sow, handy and convenient when the pigs suck.

After the eggs have been scattered in the hog pens by the passage of feces from infected pigs, they undergo a hatching period of several days. Depending upon favorable conditions of temperature and moisture, the eggs develop in about 14 days, during which time a tiny immature worm is formed in each egg. At this stage the egg is very resistant to weather and is most highly infective.

The unsuspecting pig, rooting in the ground, gets some eggs in his mouth and swallows them. As soon as they are warm and comfortable in the pig's intestines the tiny worms incased in the eggs awake to an excited activity. The digestive juices start dissolving away the egg shell and the worm bores from within. The shell and egg membrane is broken and the little worms escape into the intestine.

Ascarids possess three knob-like lips which they use to browse around in the intestine, taking nips here and there. Ordinarily these worms live in the small intestine, but occasionally they go on a spree and wander around among the pig's giblets to such places as the stomach, large intestine, bile ducts, or gall bladder. They feed on the intestinal cells and on the nutrients originally meant for the pig. They not only deprive the pigs of their proper nourishment but reduce the assimilative powers of the intestines and the pig gets scrawny and undernourished.

After drilling through the intestines they head for the blood vessels, usually the arteries and veins of the main circulation, and are carried by the rushing blood to the liver, heart, and lungs. Sometimes they get lost and wander to the kidney. The journey may take from three to ten days. Most of the worms finally reach the lungs from whence they are coughed up and swallowed. By this time the worms have developed from five to ten times their original size and are just visible to the naked eye. They find themselves back at their starting point in the intestines, where they grow and mature. After a period of adolescence, they court, mate, and reproduce. The journey through the blood

**SMALL WONDER** this stunted shoat has lost interest in life. His intestines recently harbored the roundworms, purged by a dose of Phenothiazine, in the litter about him.

**BOTH** Phenothiazine and Sodium Fluoride can be administered in dry feed, mixed by hand, shovel, or machine. A vet should prescribe dosage and time the treatment.

stream and through the various organs of the pig is only a stall for the worm to gain time for complete development. The entire development takes from two to three months.

If the infection is a heavy one, the worms may do a great deal of damage on the migratory trip. Destruction of the liver, with hemorrhage, is common. The most important damage is in the lungs where the worms cause hemorrhage and pneumonia. Occasionally pigs die from the onslaught of the worms drilling through the lungs. Infected pigs commonly show symptoms known as "thumps", labored breathing with harsh coughing and muscular spasm like hiccoughs.

Although the liver and lungs may heal, the injuries usually leave permanent scars which look like small, pearly-white spots. The entire liver may be covered with scar tissue.

The damage done by the mature worms in the intestinal tract is not as spectacular. Large numbers of worms cause digestive disturbances, intestinal obstructions or retarded growth. Growth may be retarded to such an extent that the animals cannot be marketed in time to be profitable. Occasionally the worms crawl up into the bile ducts of the liver, blocking the flow of bile into the intestine. The bile is then carried in the blood stream and stains the flesh yellow and gives it an unpleasant flavor. Such meat is unfit for human food. Due to the capricious habit of biting small pieces out of the intestine, the worms may cause ulcers.

Pigs may carry light infections of worms, perhaps ten to twenty, without showing any symptoms or lesions. On the other hand, as high as 500 worms have been removed from one pig. In large scale infections the pig is stunted, pot-bellied, and underweight and he eats like all get-out and doesn't fatten.

The natural host for the worm is the hog, although the ascaris in humans is identical. However, the infective eggs from man do not produce mature worms in healthy hogs, and the reverse is also true. The tiny worms can migrate through the lungs of man and laboratory animals, including mice, rats, guinea pigs, and rabbits, but do not reach maturity.

The best way to control roundworms is by a sanitation program designed to

**SOME REMEDIES are administered efficiently and quickly by means of capsules injected into the animal's throat with a gun. Mixing with feed is easier.**

break the life cycle of the parasite at its weakest point, while he is in the soil.

The most successful method of control is known as the McLean County system of swine sanitation. This system was designed for the control of ascaris under the conditions common in swine-producing areas of the middle-west. The original plan was carried out on a practical scale on farms in McLean County, Illinois, in 1920, and has been widely adopted.

To protect young pigs from ascaris infections, the first step must be taken before the pigs are born. From then until they are several months old they must be kept entirely away from old hog lots or pastures.

The sow is thoroughly washed and scrubbed with soap and warm water just before farrowing in order to remove mud, dirt, and any ascaris eggs clinging to her body. Immediately after being scrubbed, the sow should be placed in the farrowing pen. This pen preferably has a concrete floor. The entire pen, including floors, walls, guardrails, and troughs, should be washed and scrubbed with a hard broom with plenty of boiling water and lye. The hotter the water the more effective it will be in destroying the ascaris eggs. The lye acts as a cleaning agent. Remove all litter from the building and vicinity.

The amount of lye in the water is a matter of opinion. Some farmers use one pound of lye per gallon of water; others one pound to 10-20 gallons of water. The stronger the solution, the more effective it is in removing dirt. It is the boiling water that actually kills the worm eggs. Be sure all cracks and crevices have been thoroughly cleaned. After scrubbing, the pen should be rinsed in clear, hot water. Cleaning the pen with disfectants will not kill ascaris eggs, but it will clean up other pests and bugs.

After farrowing, the sows and pigs are not removed from the farrowing pens until ready for pasture. Care should be taken not to carry worm eggs into the pens on dirty shoes. As an extra precaution, clean your shoes well before going on the premises and, if possible, clean the pens without entering them.

Ten days after farrowing, the sow and her litter are carted to a clean field of pasture. This may be done any time after warm weather arrives. Remember the animals should be carried—not driven—to the pastures. If this is not done you may nullify all of the previous work of scrubbing and cleaning. The young pigs are kept on pasture for approximately three to four months.

A pasture used recently for hogs may be contaminated with eggs. Place them on fresh, new pasture, which should be rotated every year. If the young pigs are kept from contaminated soil for at least four months, the chances of infection with ascaris is very small. After weaning, the

(Continued on page 139)

SAME AGE, SAME FEED, but the white shoat won't gain with a belly full of roundworms

THESE THREE CARCASSES are from the same litter, fed the same feed. The one in the center was host to a mess of roundworms and lost money on his feed, is poor in quality.

BY TELL-TALE SIGNS corn notifies the farmer of its hunger. The first leaf indicates nitrogen deficiency in its inverted, V-shaped yellow streak; the second is purplish, usually the sign of phosphorous hunger; shriveled, brown edges on the third show potash lack; streaks of yellowish white between veins show magnesium hunger on the fourth; the fifth is normal.

# Hunger Signs in Corn

BY W. C. HUFF

One lusty lunged pig can inform everyone on the farm that he's hungry, but thousands of stalks of corn will starve silently and turn out nubbins in the fall. Your field of corn can't voice its needs, but it does give you hunger signs. If you use your eyes they are as unmistakable as the squeal of a hungry pig.

Corn demands a sufficient, balanced supply of nutrients, the three major ones being nitrogen, potash, and phosphorous. A 100 bushel per acre corn crop, for example, uses 120 pounds of nitrogen, 45 pounds of phosphate ($P_2O_5$), and 100 pounds of potash ($K_2O$) per acre, a total of 265 pounds. If all of these three nutrients were supplied in one dose to the soil, it would require the equivalent of about 1,300 pounds per acre of a 10-10-10 fertilizer which would supply 390 pounds of nutrients. The difference between 265 pounds, what the corn needs, and 390, what is available, is lost because in most soils about two-thirds of the phosphate is "fixed" and cannot be used by the corn. All but 390 pounds of the 1300 pounds is the carrier, or vehicle, for the elemental nitrogen.

Many farmers apply approximately 100 pounds of a mixed fertilizer such as 3-12-12 per acre. For a 100 bushel corn crop, the soil must then supply about 98% of the nitrogen, 91% of the phosphate, and 91% of the potash. Very few soils today can supply this amount of nutrients during any one growing season. If a good crop is to be produced and if a decent soil heritage is to be passed to future generations, more plant food must be supplied.

### Nitrogen Hunger

Corn has ways of letting you know when the available supply is low.

If the corn plant is light green in color and there is an inverted V-shaped firing starting on the bottom leaves, it is seriously suffering from lack of nitrogen. The firing begins at the tips of the leaves and moves up the midribs. In the early stages, the inverted V is a bright yellow while the remainder of the leaf stays a pale green. Finally the entire leaf turns yellowish brown and dies. In severe cases of nitrogen firing, over half the leaves of the plant are knocked out of production.

It's an age-old custom to point knowingly at brown, fired leaves and talk regretfully of the drought in July and August. Experience in widely divergent sections of the country show that this

**"MAKE THE BEST BETTER"** is the motto of the Jolly Soldiers 4-H Club of Crawford County, Iowa, among whose members are Mr. and Mrs. Fred Knop and their ten children. Next time someone mentions the American farmer, think of this family picture. It will give you a good idea of the kind of citizens upon whom we depend for most of the food we eat, much of the clothing we wear, and many exciting new industrial products from the soil.

# Portrait of tomorrow

Why do we print this family portrait?

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General Mills itself runs a farm. It is an ordinary farm, except that its chief product is not food, but facts. At the Larro Research Farm—not far from Detroit—our scientists are working hand in hand with agricultural schools and government agencies to improve the breeding and feeding of livestock and poultry. Farmers are turning these practical facts into more and better food for you.

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firing is the result of nitrogen starvation, not of drought. In dry weather leaves roll or twist without loss of green color, except, of course, in periods of extremely prolonged drought, in which case the top leaves only become scorched with no definite pattern.

If nitrogen hunger is recognized early enough (when only the bottom leaf shows firing, or better still, when tissue tests show that the plant has run out of nitrogen), nitrogen side-dressed so as to be available to the roots will do wonders in preventing further so-called "signs of drought". However, the smart farmer will plan to supply adequate amounts of plant nutrients by applying sufficient initial applications of *all* essential plant foods. An exception to this can be found in the Eastern coastal plain soils and some other areas where the light textured soils are subject to nitrogen leaching. Here it is well to supply sufficient minerals at planting time but to withhold part of the nitrogen to be applied as side dressings.

### Potash Hunger

The bright, yellow inverted V is the telltale signal of a shortage of only one of the three major plant food requirements for corn. An attempt to grow crops with nitrogen alone is about as futile as accomplishing a takeoff in a superfortress without the wing assemblage. The farmer must be able to recognize also the signs of other nutrient deficiencies.

Shriveled brown leaf edges are warnings of potash hunger. The first signs are always in the lower leaves of the corn plant. The burned, shriveled area gradually moves toward the center of the leaf until much of the surface is affected.

### Phosphorus Hunger

Phosphorous hunger signs are not quite so unmistakable as those for nitrogen and potash. True phosphorous deficiency is exhibited by a deep bluish purple color in the leaves during the earlier stage of growth. However, a stray cow in the cornfield may give the leaves a "phosphorous-hungry" look, for a broken leaf will turn purple after a few days.

### Magnesium Hunger

Another essential for good corn production is a plentiful supply of magnesium. A shortage in this is recognized by a yellowish white streaked appearance.

If a farmer wants to stop the chorus of squeals from his pig pen he must fill them all up. In the cornfield, a farmer will often lower his plant population by thin planting and later even chop out plants in order to have enough plant food to produce ears on the remaining stalks. But he doesn't kill off young pigs — instead, he adds a little more feed to the trough. Similarly, the plant population of a field may be increased profitably when sufficient plant food is supplied.

One should remember, however, that increased planting rate can be carried to the point where water, and possibly sunlight, might become the limiting factor. Practically all areas have sufficient rainfall and sunlight to justify increasing the planting rate considerably, providing it is accompanied by increased applications of complete plant food.

Another factor the farmer must consider if he hopes to prevent silent starvation of his corn next year is correct cultivation. A pig will starve if his trough of feed is on the other side of the fence. If deep, late cultivation cuts the corn roots, the plant is left "on the other side of the fence." There may be starving plants in the midst of plenty. Of course, cultivation must be geared to control weeds that otherwise would rob the corn plant of valuable food and water. It's a case of cultivating "not too much but just enough."

"Not by 'food' alone" will the farmer be able to prevent starvation signs in next year's crop. There should be a combination of good farming practices including legumes and sod in a planned rotation. Commercial plant food can be most effectively utilized in conjunction with a program of crop rotation and cultural practices which maintain organic matter, good soil aeration and drainage, water absorption capacity and all of the desirable soil characteristics which go to make up what is commonly known as good soil tilth.


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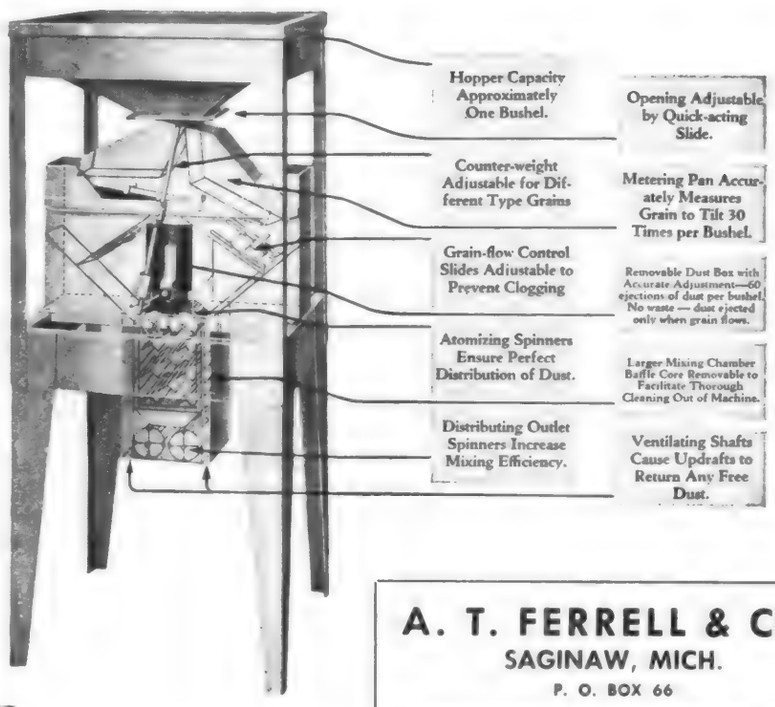
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**E. B. Tussing, Ohio, W. C. Libby, Maine, and J. R. Robertson, Idaho, collaborate on potatoes.**

# THE SPUD

THE potato, more commonly referred to as the spud, or just "taters," is king of the tubers. Mashed, baked, boiled, lyonnaise, au gratin, German, home and French fried, warmed-over and raw, it feeds more of the earth's billions than any other crop except wheat. The average potato production of the world looks like a quotation from the national debt—something like 7,200,000,000 bushels which allows about three bushels for every man, woman and child on the face of the earth.

Most people everywhere, except fat ladies, eat potatoes at least once a day, but in certain parts, like New England, it appears on the dining table three times a day. It turns out of the earth in quantities greater than any other crop and will grow almost everywhere.

Although it is sometimes called the Irish potato, there's nothing Irish about it. It is a native of South America, where the Indians cultivated it. The early Spaniards took it to Europe in the sixteenth century but at first it wasn't well received. Europe's peasants were congenitally hungry in those days and politicians regarded the potato as a gift from God to prevent the recurrent famines. In spite of laws to force potato culture, it was not until the very bad famine following the Silesian wars that the spud got a firm place in the daily diet of the European.

When the potato was introduced into England it hit a snag at once. People liked it, but the wheat growers, fearful lest the new crop should compete with bread, launched an active campaign to combat its growing popularity. In a very up-to-date method of influencing public opinion, they formed an organization, which they tagged with a ponderous and misleading title, "Society for the Prevention of Unwholesome Diet." The organization achieved a vicarious immortality, for the potato has since been known informally by the initials of the society.

In America, the potato is a reimportation, reappearing in America in 1719. In that year a planting of stock brought over from Ireland was made at Londonderry, New Hampshire. From this came its popular descriptive name, Irish Potato.

### Potato Kingdoms

Fifty years ago potatoes were grown on almost every American farm in "potato patch" extensions of kitchen gardens, but there has been a decline in home plantings in recent years because insulated refrigerator cars made shipping easy and safe. Also, soils are worn out and disease so infests garden spots that it is often cheaper and easier to buy potatoes than to raise them. Small plantings continue to supply some home needs.

Commercial production gradually centered in oddly scattered areas, notably in Michigan, Maine and Idaho, and in the

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**AROOSTOOK COUNTY grows most of the big Maine potato crop, 13% of the American crop. Maine has cool days and nights and the right soil for bumper crops.**

**ON LARGE ACREAGES picker type planters which drop the seed automatically are preferred to the assisted feed type which takes two men to operate. Fertilizer is applied by the planter in bands on each side of the seed piece at the bottom of the trench.**

south from whence the early markets are supplied. There is no longer a continuous area which could be called the potato belt.

The best potato soils in the big potato producing counties range from fine sandy loam to silt loam with good natural drainage. Muck soils are extensively used in California, Oregon and scattered areas in the north central states. The mucks are excellent for potatoes when well-drained and fertilized.

Dr. John Bushnell of the Ohio Agricultural Experiment Station applied sand to a silt loam soil and increased yields from 32 to 74 bushels per acre. He also laid 4-inch tile under potato rows and planted with a machine over the tile so that only about an inch of soil separated the seed piece and tile. The increase in yields was about 70 bushels per acre. This research put the clinches on what farmers had already discovered, that the potato plant needs plenty of air around its roots. Everything else being equal, the light soils will produce more than the heavy soils. Soils should be distinctly acid to control scab. A ph of 5 to 5.3 is desirable. Because no practical method has been found for reducing the ph of soils high in lime, scab-resistant varieties are being developed which will grow in distinctly sweet soils.

### Preparation of Seed Bed

It is essential to have a deep, mellow, well-aerated seed bed. Many growers plow 10 or more inches. If shallow plowing has been the practice on a field, increasing the depth must be gradual on most soils—about one-half inch per year—in order not to bring up too much hard pan at a time.

The soil is plowed when it shatters and the furrows are thrown level. If the soil is right, the plow need be the only tool used. The seed bed is then ready for planting. Discing and harrowing the turned soil are not recommended because they destroy the soil structure and heavy rains will settle and pack it. When it is necessary to plow early and the soil settles or is packed by heavy rains, a deep tillage tool is used once through to loosen the soil again before planting.

**MANY PLANTERS, both automatic and hand fed, operate on the principle of rotating slots which drop the seed into a tube extending to the trench bottom.**

### Planting

In the south and central states the early crop must be planted so that maximum growth is obtained before the highest temperature reaches 75 degrees, when tuber growth practically ceases. For a mature crop before the average mean temperature rises to 75 degrees, it is necessary to plant so early that there is often risk of damage from late spring frosts. But the risk of having frost damage once in several years is more than offset by the increase in yields of 40 to 50 bushels per acre by the early planting. In the north potatoes are planted early because of the short growing season. In the central states, because of a longer growing season, late potato planting is sometimes delayed until late May or the first of June. These late plantings are made to extend the growing season into the cool fall weather. With the introduction of the newer varieties replacing the Rurals (which produced many ill-shaped tubers) growers are planting earlier in April or May. The earlier planting can be dug before wet, cold fall weather sets in.

Before the introduction of the potato planter, the potato seed was dropped by hand in furrows made with a single shovel or furrow plow. The seed was covered by pulling a small amount of soil over the pieces with a hand hoe. On larger plantings, covering was speeded by plowing the furrow shut. How well this was done was in direct proportion to the skill of the driver and the disposition of the mule pulling the plow. Some seed was covered too deep, some too shallow, and came up spotty.

Hand planting is still used in small patches or in gardens and the potatoes are fertilized by spreading fertilizer in the open furrow, then mixing it with the soil by running the single shovel plow through the furrow. In hand planting the seeds

are placed 4 to 5 inches deep and covered with a small amount of soil. The soil is leveled by cultivation.

Modern planters are now designed to plant deep. The weight of the loaded planter aids in getting depth in mellow seed beds.

The picker type planter which does its job automatically is preferred by most growers to the assisted feed type which requires two men for operation. For large acreages the double speed, two-row planter has replaced the four-row.

In the north-central states level cultivation is followed because ridging results in lower yields in droughty periods. This practice requires planting the seed 3½ to 4 inches below the surface level on the heavier soils, and 4 to 5 inches on the lighter soils. To hasten come-up and reduce seed rot, the potatoes are planted in a trench and covered with about 2 inches of soil by dropping the opening discs and the planter shoe and raising and adjusting covering discs so that little soil falls to the center of the trench. This leaves a depression but sufficient soil is thrown over the seed to cover it. The soil is leveled progressively by cultivation as the potatoes come through the soil.

### Cultivation

John Parksman, an Illinois potato grower, once said that the most important cultivation for potatoes was made before the seed is planted. He explained this statement by saying that it was impossible to cultivate near the seed piece or under it after the seed is planted.

The main reasons for cultivating potatoes are to destroy weeds, to keep a mulch on the soil, (especially where the soils crack badly during dry weather), and to keep the developing tubers covered with a blanket of soil.

The smoothing harrow is an ideal tool for weed control until the plants are about 6 inches high. The teeth are angled back so they will not disturb the sprouted seed pieces. After the plants reach a height of 5 to 6 inches a weeder is used, operated in the same direction each time so that the potato vines are pulled over the rows to shade the spaces between the plants. Flame throwers to kill weeds are now on the market.

On some of the heavier soils that have a tendency to pack it is necessary to use a cultivator because the weeder will not penetrate the soil deep enough to kill the weeds. Cultivation except for weed control is seldom necessary and is likely to result in actual reduction in yield because of the damage to the potato roots and the increased loss of moisture from the loose soil. Cultivation is discontinued when the plants come into full bloom. Most growers who use row cultivators prefer the sweep or duck foot type shoes which scrape the soil about a half to an inch deep. On varieties such as the Katahdins, which set tubers high, the shoes can be adjusted to throw a small amount of soil to the rows.

MULTIPLE ROW SPRAYERS with three outlets to the row make insect control over large acreages easy and quick. All-purpose sprays and dusts are nearing perfection.

THE IRRIGATION OF POTATOES in the mid-west is well under way, but more research is needed to make it adaptable to all areas. This is an Indiana installation.

If the tuber is exposed to the sun while growing it turns green and bitter. This is called greening.

### Bugging and Spraying

There might have been a time when a farmer could get a crop of potatoes without giving too much attention to insects and disease, but that time is gone forever. Bugging the potatoes was a boy's chore which is remembered not too fondly. On a hot July afternoon it was no joke to go from vine to vine, shaking the Colorado beetles off into the wash basin with a stick. The accumulated population was then dumped into a wash tub and treated with boiling water or unslaked lime. The expiring bugs gave the perspiring small boy his reward.

Modern sprays have eliminated the old fashioned bugging. The plants are sprayed when they are small, three to four inches high. This will require 100 to 125 gallons per acre. As the plants increase in size the amount of spray is increased so when vines are in full bloom 200 gallons are required to obtain good coverage. Spraying should be done every 7 to 10 days. Applications every 10 days will give excellent control of leafhoppers, but if the flea beetle population is heavy, then spraying should be every 7 days to obtain best control. When there is an outbreak of late blight, it is necessary to spray oftener than every 7 days.

Late blight is the most common disease of the potato foliage in the northeastern states where it frequently causes an epidemic.

In the central states the most foliage damage is done by a couple of voracious

**POTATO DIGGERS, from home-made to commercial, run the gamut of efficiency and ingenuity. Some require several men to operate; some deliver the potatoes sacked. None as yet are educated enough to distinguish between a spud and a rock or clod.**

devils, the potato leafhopper and the potato flea beetle. Leafhopper damage is sometimes mistaken for blight. The leafhopper is a sucking insect which sucks the juice from the leaves causing them to turn brown around the edges and curl. The flea beetle is a chewing insect and eats small holes in the leaves.

A Bordeaux mixture has been the most effective spray since spraying became a regular job for the potato grower, but within the past two years this mixture in combination with DDT has achieved excellent results.

There have been slight variations in the formulations but the most popular formula is 8 lbs. of copper sulfate, 8 lbs. of hydrated lime, 1 lb. of the 50% wettable DDT and 100 gallons of water. Bordeaux is used for the control of blights and DDT for the control of insects especially leafhoppers and flea beetles.

On a twelve-year test the Bordeaux sprayed plots at the Ohio Agricultural Experiment Station showed an average yield of 458 bushels per acre, against only 300 bushels per acre on unsprayed plots. In 1945 when DDT was used, leafhoppers were completely eliminated and the yield was 45% larger than when Bordeaux mixture was used alone. DDT controls flea beetles better than any other material so far discovered.

Some growers prefer to use dust. Dusting is just as effective as spraying provided enough material is used. For dusting the mixture is fixed copper, 14 lbs., 6 lbs. of 50% DDT, and 80 lbs. of talc. Early applications of dust are applied at the rate of 25 to 30 lbs. per acre and then increased up to 80 lbs., which makes it comparable to wet spray.

Sprayers should be capable of delivering 2 gallons of spray per minute per row at 300 to 400 pounds pressure. Wheel damage to vines is reduced by the use of lifters and wider booms covering 10 to 12 rows. Most of the growers use booms carrying three nozzles per row, one above and one on each side on separate leads so they are adjustable to different size plants. The two side nozzles are adjusted to direct the spray downward at an angle, and the top one straight down to direct the spray. This gives the spray a whirling motion which covers both the top and underside of the leaves. For the first spray the side nozzles are about 12 inches from the row and about 8 inches above the soil. As the plants increase in size the whole boom is raised and the side nozzles widened. When the plants cover the row most growers aim the nozzles directly down on the plants. Some growers add a fourth nozzle, placing it beside the one directly above the row for better coverage of the large plants.

### Diseases

Potato diseases are many and varied. Among them are late blight or rust, bacterial ring rot, leaf foil, mosaics, scab, rhizoctonia, blackleg, spindle tuber, purple top, stem end browning, giant hill, and early blight. Rotations, seed certification, sprays, planting schedules, and other methods are used to eliminate and control diseases. The plant pathologist is an important man to the potato grower and his advice is carefully followed. There's one on your state extension staff ready to advise you if you get into trouble.

### Harvesting

The harvesting of the early crop of potatoes usually begins before the tops are dead, when tubers feather or skin and bruise easily. Early harvesting means extra dollars because the consumers are willing to pay higher prices for new potatoes. Harvesting should be delayed until the tops have died so that the skins of the potatoes will have hardened. However, it is not always possible to delay digging until the vines die. This is especially true in the far north where the growing season is short and late varieties are grown.

The use of DDT is also a factor in lengthening the growing season by one or two weeks which further complicates digging. In some areas the tops are mowed (especially among the certified seed growers) about 2 weeks before digging to allow the skins on the tubers to toughen. Chemicals are now on the market for killing the green tops and these are being used as sprays or dusts.

The digger should be wide enough and set deep enough to prevent cutting of the tubers and to provide sufficient soil to cushion the potatoes until they pass the end of the elevator. As a further preventative in injuring the potatoes when the soil is loose and does not carry over the elevator chain, the diggers may be padded.

Potatoes are picked from the ground by hand and placed in crates. They are then hauled to storage sheds and packed in burlap bags, which protect them from the direct rays of the sun.

### Combines

During the war shortage of labor inspired some home-made potato "combines," machines which not only dig the

A WELL-TRAINED TEAM is needed to pull this hand-fed potato planter, one of the first types on the market. This Maine field was plowed in August and planting was finished before Memorial Day. Harvest starts in mid-September, is over before the mid-October frosts. Maine potato production is highly mechanized. Note the humus content of this fine seedbed.

potatoes, but pick them up, sort and sack them. Built at first by inventive farmers, the machinery companies have seized the idea and soon they will be available on the market. Besides cutting labor costs in half they have speeded up the harvest and eliminated the backache.

With the best of the machines a crew of 5 can do as much work in a day as 12 hand pickers and harvesting is reduced to 10 or 15 hours per acre. There's one thing the machines can't do—they can't tell the difference between a potato and rocks and clods. Sorters do this now, riding the machines. Perhaps the machinery boys will find a way to educate future combines.

When temperatures reach 90 degrees digging should cease or the potatoes should be picked from the ground immediately to prevent sun-scald. Sun-scald is not detected until 18 to 24 hours after exposure. It first appears in limited areas ⅛ to ⅜ inches deep, covering only a part of the tuber. The covering over the affected area has a watery appearance with a narrow dark area around the margin. The entire tuber soon breaks down and becomes soft and has a very disagreeable odor.

### Storage

A potato looks rugged but in many ways he's a delicate and temperamental critter, and is especially demanding about the appointments of his winter quarters. Temperatures and humidity must be closely regulated. The flavor and keeping qualities depend on the care with which potatoes are stored.

Both above-ground and underground storage are used, the underground being the most economical. Potatoes are easily stored if they are free of disease and solid. Early potatoes can be placed in temporary storage if they are to be sold before extremely cold weather. If held at a temperature of about 60 degrees and a high humidity of 85%, bruised and cut areas will heal readily and shrinkage held to a minimum. Potatoes that have been held at this storage temperature have better cooking qualities than those held at lower temperatures.

Potatoes stored at low temperatures accumulate sugars as the result of the hydrolysis of starch. When French fries or chips are made they will brown quickly because the sugar carmelizes. Many varieties will improve in cooking quality if held at 60 to 70 degrees about two weeks before being used.

When late potatoes are stored until after the first of the year, the temperature must be dropped to 36° to prevent sprouting.

After potatoes are dug in the fall, the farmers and the trade divide the task of holding the stocks in storage for a year while consumers draw them down. As the months go by, the potatoes shrink in weight, commonly about 5%, by loss of moisture in an inevitable progression toward a wizened old age. Under ordinary storage conditions potatoes will shrink 2% a month for the 7 months they usually remain in storage. If, in addition, they are allowed to sprout, the loss of weight is accelerated; the unsightly sprouts can be removed by appropriate tumbling, but they may have drained out another 5% to 15% of the original weight and the housewife rejects the shriveled spuds, calling them "old," although they may be actually younger than others which enjoyed better handling!

**THESE WIZENED SPUDS have not wintered well. Under ordinary storage conditions potatoes will shrink about 2% a month. If the temperature goes above 36 degrees and the humidity is high they will sprout and shrink. Those sprouts were once good eating potatoes.**

The presence of ripening apples will prevent sprouting because the apples give off ethylene gas which is inhibitive to growth of potatoes—it gets in their eyes! Numerous other chemicals in the eyes (or seeds) of the potatoes will check growth but the chemist takes a hint from the chemical constitution of the natural hormones that regulate the potato's growth and provides a chemically-similar synthetic, methyl ester of alphanaphthaleneacetic acid, to prolong the period of natural dormancy. This material is slowly volatile and a quarter teaspoonful distributed on the potatoes in a dust or in a spray solution before bagging will vaporize into the eyes of a bushel of potatoes in sufficient strength to do the trick. Thereafter the potatoes, put into normal trade storage in August, will be found still practically sproutless the following May. Indeed, test lots kept at 52°F. for twelve months have not sprouted.

Where operations are on a large scale, the potatoes pass under a power atomizer or a dust applicator on the chute loading the storage bins. In smaller operations of 1000 bushels or less, the dust is blown in among the potatoes by hand dusters. The amount that could thus be saved from impairment by sprouting runs to millions of bushels annually. Protected potatoes earn a premium price which more than covers their extra cost. Potatoes set aside as seedlings are, of course, not appropriate subjects for the treatment.

The humidity should be maintained at about 85% to prevent shrinkage. If either table stock or seed is to be kept until late spring, bins should be constructed to permit air to circulate around the pile, which should not be more than eight feet deep. Potatoes to be sold early in the spring may be stored in a continuous pile of 12 or more feet in depth.

The oxygen requirements of potatoes during storage are so small that no special ventilation is needed except to control temperature. To cool a well-filled storage space to 36 degrees before the end of the resting stage will require special care in ventilating. To do this the ventilators are opened during cool periods and closed on warm days. Ventilators in the ceiling are used to allow the warm air generated by the potatoes to escape. If the temperature is mild the doors can be used for intake of cold air. Light must be excluded and freezing temperatures avoided.

Potatoes may be cheaply and safely stored outdoors in pits. The drawback to pit storage is the inconvenience of removing the potatoes during winter months.

This method originated in New England and was brought west by the pioneers. A shallow pit is dug, ordinarily in the potato patch, and the spuds are piled on a thick bed of straw. They are then covered with straw and sometimes corn stalks and then the whole is covered with earth to a depth to prevent freezing. Care must be taken that the pit is well drained. The potatoes—as well as cabbage, apples, and other root crops, come out of the hole during the winter and spring in top condition.

### Grading—Packaging—Marketing

Most wholesale transactions in potatoes in the United States are made on the basis of U. S. No. 1 grade. Sizing machines are often misnamed "graders." A sizing machine sorts for size but defective tubers must be picked out by hand as they pass over the picking table attached to the sizing machine. The rolling picking table is preferred because the rollers turn the tubers so that all sides are readily seen. Workers on the picking table must be familiar with the U. S. standards.

Brushers for cleaning are also available as added equipment on sizing machines. Many potatoes are now being washed; this requires expensive equipment and should include a drier for best results. Washing is essential if potatoes are to be packed in paper. If the potatoes are not dried, water collects in the injured areas, preventing the healing which in turn results in breakdown. Potatoes may leave the farm and arrive in the market in good condition, especially under pre-cooling, but considerable soft rot may develop if they become warm.

A few years ago potatoes were shipped only in barrels and 150 lb. bags; then 100 lb. bags, and now 50, 15, and 10 lb. paper bags, have been added. The consumer likes potatoes packed in paper because the potatoes keep better and they are easy and clean to handle. If the consumer is to continue to buy "sight unseen" the potatoes bagged in paper must be kept to a high standard.

### Certified Seeds

Potatoes grown for seed purposes under rigid rules and inspection by state authorities are known as "certified seed." The certification procedure is designed to insure seed that is as free from disease as is practical to produce; and to insure its being of the correct name variety.

Since the beginning of seed certification many methods of checking seed have been introduced; the use of tuber indexing (testing one piece of seed in a greenhouse); tuber uniting (planting all seed pieces from a tuber in a unit); isolating foundation plantings, and the cutting of the tops when there is an aphis outbreak; testing of samples in the south during the winter months; the training in some sections of special roguers who rogue the fields for the farmers; (the term, "roguing" means the removing of all diseased plants from the field); and finally the supervised breeding of disease-resistant varieties of potatoes.

Most of the seed in the United States is grown in the northern tier of states or at high altitudes. There is excellent vine growth in these cooler climates and there are fewer insects that carry diseases and less masking of the diseases when they are present. The weather is favorable for maintaining low storage temperatures that will prevent the sprouting of seed. Health and vigor of seed are the most important factors which influence its productivity.

GADGETS TO SPEED CUTTING of seed are mostly home-made. This one was rigged at East Lansing, Michigan. The suspended can contains a disinfectant which keeps the knife bathed and spreads the disinfectant over each cut surface, killing the bacteria.

The best method of selecting seed is to buy from a grower or dealer of known integrity.

The popular varieties in the north central states are: early varieties, Irish Cobbler and Triumph followed by Chippewa and Katahdin; late varieties include both the Russet and White Rurals, which are rapidly being replaced by Katahdin and Sebago.

### Rotations

In order to maintain an acid soil and control grubs and wire worms, special rotations have been worked out for potatoes. These pests thrive on timothy-clover sod so it is advisable to eliminate this grass combination from the fields intended for potatoes.

The most popular rotation is the two-year one: potatoes, wheat or oats, and clover. Where the two-year rotation is used many growers combine the grain.

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SEED PIECES should weigh 1 to 1½ ounces, and should have one or more eyes.

# BARNYARD GOLD

By ALDEN STAHR

NO ONE knows by what accident the first Indian discovered that a fish dropped in a hill of corn made it grow faster and produce a bigger ear. The use of animal wastes to fertilize crops is as old as farming itself, but until the soil chemist got out his microscope and test tubes the reasons why animal excreta make better crops were generalizations and hocus-pocus.

The European peasant literally builds his home around the manure pile and the aroma of its steaming presence outside his door is sweeter to him than all the perfumes of Araby. He knows that more and better manure, properly handled, is the prime reason why land that has been farmed since the dawn of time can still produce forty bushels of wheat to the acre.

The American farmer is coming around to the same conviction. Most of our farming land has been farmed not more than 150 years, yet it shows nation-wide signs of wearing out.

However, there is still a surprising amount of misinformation about manure. Who hasn't a tidy set of pet notions, good and bad, about how to store it, spread it, and make it? In the same community you can hear that it must be hot to do any good; that it must be rotted for two years before spreading; that it should never be used fresh for it will burn out plants.

Just where does the truth lie; what have the science boys and thinking farmers discovered about barnyard gold? Among the first experimenters to approach manure scientifically was a Frenchman named Palissy. About 400 years ago Palissy said, "You will admit that when you bring dung into the fields it is to return to the soil something that has been taken away. When the plant is burned it is reduced to a salty ash which apothecaries and philosophers call *alcaly*. Have you not seen certain laborers when sowing with wheat for the second year in succession burn the unused wheat straw which had been taken from the field? Being burnt on the ground it serves as manure because it returns to the soil those substances that had been taken away." (burning retains the minerals in the ashes but destroys the humus value of the crop residue, we know now.)

Equally short of the complete truth, but in a different way, was the statement of the Belgian, Van Helmont, who in the 1600's said plants live on water alone. Van Helmont performed an inconclusive experiment: "I took an earthen vessel in which I put 200 lbs. of soil dried in an oven. Then I moistened with rain water and pressed hard into it a shoot of willow weighing five pounds. After exactly five years the tree that had grown up weighed 169 pounds and about 3 ounces. But the vessel had never received anything but water to moisten the soil. In the end I dried the soil once more and got the same 200 lbs. I started with, less about two ounces. Therefore, the 196 lbs. of wood, bark, and root arose from water alone."

Van Helmont made a careful experiment for his time, but he overlooked two things, the part played in plant nourishment by carbon dioxide, which comes from the air, and the missing two ounces of soil.

A closer observer was the Englishman, J. B. Lawes, founder of the first scientific agricultural experiment station in England. For fifty years, beginning in 1843, the same crop was grown continuously on his experimental farm on the same land with the same manure or fertilizer, and the yields determined. Prior to the beginning of the experiment no manure had been applied to the land for five years, but there was a large reserve of natural fertility. Due to this, the unmanured sections of the test field gave a practically constant yield but the manured section showed a large increase at first and then continuing gradual increases each year. Even if no longer manured, the second plot would have maintained its advantage over the unmanured plot for many years.

Another section of the field of eleven acres was given fixed nitrogen, potash, and phosphoric acid fertilizer and the yields were only slightly less than in the manured crop, but high yields would

WELL-ROTTED MANURE such as this has lost some of its nutrients and its value as humus has been reduced at least one half by shrinkage. Its minerals are concentrated.

HERE GOES CASH MONEY. Washed by the summer rains and the winter snows, manure in the open will lose half its nutritive powers in three months. If it can't be spread at once, better leave it pile up in the barn under the treading feet of the stock.

not have been maintained in succeeding years if no fertilizer were added.

One plot was given nitrogen fertilizer only. The yield kept up at first, but finally declined due to lack of minerals.

It was also noticed that manured soils had better tilth and mechanical condition than unmanured and that they held more moisture and so gave better yields in dry seasons.

### Plants Cannot Live by Manure Alone

Out of the work of these and other experimenters and the discoveries of dirt farmers came the first knowledge about plant foods. Later workers proved that the basic needs of plants are: light, oxygen, moisture, warmth, physical support and food. The first two come from the atmosphere and an additional, and perhaps the most important, factor, carbon dioxide, which is made into cell material, also comes from the air. The others come from the soil.

### Plant Dietetics

Here's the diet list for healthy, happy plants:

1. Stuff the soil with organic matter, litter, manure and plow-under crops such as green soy beans, vetch, clovers, alfalfa and grasses.

2. Make nitrogen available with manure, green crops and commercial fertilizer.

3. Spread lime to supply calcium and to counteract acid condition of soil as determined by analysis.

Of all the plant foods, manure is probably the most direct problem of the farmer. Commercial fertilizer he buys and spreads in amounts determined by analysis. And green crops, planted and plowed under, help to maintain tilth, nitrogen and organic level in accordance with planned crop rotation. But manure, important for not only its immediately available plant food but for its long-term ability to improve land, seems to be the least understood and so merits a full discussion.

For manure is entirely in the hands of the farmer. It is his to make by feeding his stock, his to pitch, his to spread, his to waste or wisely use.

### Here's What Happens

No sooner has a cow swallowed a wisp of hay or a mouthful of grain supplement than a double action begins to take place. The chemicals of her digestive juices start to decompose the food and at the same time small organisms in her digestive tract, called bacteria, begin to feed upon it. These processes continue as the food proceeds on its circuitous way through Bessie's four stomachs. That which is not utilized by her body or in making milk comes out as urine and feces, the latter alive with bacteria. (Urine is sterile as it emerges from the animal, but the bacteria jump in at once.) The fresh

GUTTER DRAINAGE and used bedding go into this pit and are caught by a manure spreader on a lower level. It is hauled direct to the fields on this New Jersey farm.

INTO THIS URINE TANK liquid manure drains by gravity from the dairy barn up the hill. It is hauled by home-made tank wagon to the fields. Nothing is lost.

excreta, together with some dead animal tissue, mixes with and is absorbed by bedding and gutter litter and together they are stored or spread. That, brother, is manure.

Manure is perishable. On exposure to air, a type of bacteria called aërobic become active in the manure which causes heat and carbon dioxide to be given off. Ammonia gas rises, and in this form much of the nitrogen in manure may be lost.

If the manure is stored, packing tends to cut off the oxygen and another bacterial family, anaërobic, starts work. Carbon dioxide, (the result of combustion in which the carbon of the manure combines with the oxygen from the air) takes the place of oxygen in the pile, decay is slowed down and less heat is evolved, so less nitrogen in the form of ammonia is lost. Packing, with just enough moisture to help keep out the air, but not enough to wash away nutrients, is one of the best ways to preserve the fertilizing value of the manure because it excludes the oxygen and thus prevents oxidation.

### More About Bacteria

For a better understanding of what goes on in manure it's a good idea to take a look at those bacteria with a microscope. Bacteria are tiny plants which feed on the manure and take nitrogen and other nutrients into their own cells. Some of the food value in the manure they free into the soil as they feed; some is released only when the bacteria die. The long-term value of manure depends on humus, which results from the partial decomposition of the organic matter by bacteria.

Bacteria are not the only microorganisms which help to change manure into plant food. Fungi and actinomyces are in there pitching too. Fungi, related to the toadstool and mushroom, aid the farmer by decomposing cellulose and other carbohydrates found in corn stubble and straw. Actinomyces, donor of the new wonder drug, streptomycin, look like cob-webs under the microscope, break down fats, cellulose, and starches, etc., and help to build up humus. Many actinomyces are heat-loving and can grow and transform manure even when it is too hot to hold in the hand. A lot of book words, but all you need to know is that every pinch of soil contains countless millions of these invisible "hired men" supplied by manure, and constantly used up by cropping.

### Fire Fanging

Not all of the microscopic plants are beneficial. Fire fanging, "burning out" of manure is caused by mycelia using up the nutritive value of manure under improper storage conditions. Such plant diseases as root knot are caused by microscopic worms called nematodes, and there are a host of other bacterial and mold disease of plants. But diseases that might come from manure are rarely present. Not only are they destroyed by intestinal action of animals, but also by the high temperature of composting. All in all, the good deeds of bacteria far outshine the small harm some kinds do.

### Proper Handling of Manure

Proper handling is essential to get the full value out of the manure. A look at the small amount of available plant food in manure is argument enough for the cause of careful handling.

Considering both solid and liquid excrement, the solid has one-half the ammonia, almost all the phosphoric acid and two-fifths of the potash. In addition, manure contains such trace minerals as iron, manganese, copper and zinc, normally not present in commercial fer-

tilizers. These elements are lower in the urine. However, since they are in solution, they are readily available to plants. So solid and liquid manure are about equal in value. Obviously, the farmer who spreads only the solid manure on his fields is losing fertilizer.

### Collecting Manure

If you can't spread your manure at once, then it must be stored. Ideally, every animal barn should have both manure pit and urine tank for storing animal excretions, and both should be covered to prevent losses by evaporation and dilution by rain water. If the urine tank is connected direct to milking parlor gutters, it's no work to collect the liquid manure. If you don't have a urine tank, a plentiful supply of bedding in stalls and gutters helps to soak up urine and cut down loss through evaporation or leaching. Solid manure and bedding should be collected twice daily and spread or stored, depending on whether it is to be used fresh or rotted, or according to local weather conditions.

Three successful dairy farms in one New Jersey community use as many different ways of collecting urine. One has an open concrete pit filled by gravity drainage from the dairy gutters. The urine and hose-down washings are dipped out in drums and poured in this dilute solution on the fields. A second dairy differs in its method only mechanically, collecting urine and washings in an underground tank, pumping out the liquid into a tank wagon and sprinkling the solution on the fields. (The solid matter is spread each day.) The third uses large quantities of bedding to soak up the urine and this, together with solid manure, is spread on the fields twice a day, so there is no loss from storage leaching. This management takes extra time and labor not always available on the average farm. For each ton of excrement voided, 500 pounds of litter are needed to soak up the liquid.

### Storing Manure

Manure should be protected from loss by evaporation and leaching by storing in a covered pit. This pit is almost always the barn floor, and the cover is the roof. There are arguments both ways as to whether or not the pit floor should be of concrete. A concrete floor will prevent drainage into the ground, but if the walls, too, are of concrete, putrefaction may take place instead of beneficial decay. The difference is a bit technical, but here's the explanation. If all air is excluded, you have only anaërobic bacterial action. The anaërobic bacteria are those which can thrive also in the absence of air and they change ammonia to inactive nitrogen which escapes. It is this action which takes place in bogs under water and accounts for the lower value of peat as compared with surface humus. By beneficial decay is meant the decomposition of materials which are of no direct nutritive value to plants, such as sugars and cellulose, by a combination of aërobic and anaërobic bacterial action, so as to retain nitrogen. The aërobic bacteria are those which can live and work in air.

So the scientists tell us that it's probably all right to have a concrete floor or walls in a manure pit, but not both, or you'll cut down the nutritive value of the manure.

The importance of having a pit in-

(Continued on page 112)

IT'S TRADITIONAL to spread manure when it's too wet to plow in the spring, but a tractor often cuts up the soft fields. Here's where a team of horses come in handy. They make manure too, worth enough to cut a slice from their feed bill.

## THE CROSSBRED COW

(Continued from page 59)

after milking. The barns are not heated, and the animals are milked by hand.

### Progress Report Only

The table of comparative results, up to now, shown on page 59, gives the Beltsville results. Compared with their own dams, 36 out of 40 of the crossbred cows are better butterfat producers. Based on completed records, 9 out of 10 of the three-breed cross cows are better butterfat producers than their two-breed dams; or 90% of the daughters have exceeded their dams in each case. They are daughters of high transmitting sires and for that reason, it was to be expected that they would outproduce their dams. The average age at calving of the three-breed animals was 1 year 11 months.

One of the characteristics of the crossbred animals is their persistency in milk production. The records show that in many cases the monthly butterfat production varies less than 10 pounds from the high to the low month.

The Department of Agriculture workers have welcomed all farmers to see the experiment with cross-bred cattle, and, like all people engaged in pure research, ask only that their work be considered in the same spirit in which it was undertaken, with an open mind.

The visitor driving out to the Beltsville Research Center from Washington will find no great gates to announce that he has arrived. There is just the change from the Stringtown-on-the-pike look of the main road to the beautiful and gently rolling Maryland fields. There are groups of farm buildings and some of the old farm homes. Here and there on the 13,900 acre tract are new buildings belonging to some Bureau of the Department. Some are imposing enough to be part of a college. Others, like those of the Bureau of Dairy Industry, look like a large dairy farm.

The visitor who expects a startling difference between the crossbred cow and the average well-bred dairy cow is going to be disappointed. The cattle are of average size and often show decided color markings of their ancestors. Most of them are of the Holstein or the Red Dane marking. They are neither more nor less nervous than other cattle. They have been troubled little with mastitis. Their udders are consistently good and well-attached. The herdsmen report that the calves, even those of the three-breed cross, have been healthy and easy to raise. They are not freaks and handlers will confirm that they smell and act just about like any other cows.

### How They Work in a Dairy

As the Beltsville cross-bred herd has approached 100 head the budget has pinched, and a number of cows have been farmed out to commercial dairy farms. Frank Parish of Taneytown, Maryland, has a number of the crossbreds in his commercial herd. He says, "The cross-breed cows are doing well and handle nicely at all times. They are as good if not better than the best cows in our original herd.

"Six years ago we imported fifty well selected registered Ayrshire cows from Canada for our foundation herd; we have raised every heifer calf. We now have forty cows and first calf heifers, only eight of which are the older imported cows. We have culled, but improvement is very slow and we feel that we need at least a four hundred pound fat average with sixty cows for a commercially sound dairy farm of this size. We might make three hundred and fifty pounds this year without the cross-breeds, but I doubt it.

"I like the Ayrshires very much: I have visited many farms with other breeds and learned that they too had a long up-hill task to develop a large herd with a high average. As soon as I learned of the Beltsville development in cross-breeds, I studied their records and was impressed by the production increase with each cross.

"We now have several cross-bred cows which we will breed to our Ayrshire bulls and one cross-bred bull with which we will breed our entire Ayrshire herd.

"I am going to use cross-bred heifers for replacements in my herd. I expect good results and intend to carry on our pure-breed developments. With nearly 25,000,000 dairy cows in this country, only 3% of which are registered and an average production of 4,600 pounds it is important that we cooperate to the end that the most constructive breeding program possible is adopted by the vast number of grade cow breeders and the many breeders of registered cows."

### "Crosses Outdo My Purebreds"

Paul B. Strickler, who own Grassley Farm, near Waterford, Virginia, also has a number of cross-breed cattle. He makes no bones about liking the cross-breed cattle in his herd, and says, "They are, on the average, producing more than my purebred Brown Swiss. Two of the crossbred cattle X-18 and X-29, finished 305-day records on 2 milkings daily with 525 and 595 pounds fat respectively; the latter being the best production I have ever gotten in a rather long dairy experience. These are not the best of the X cows that we have, but they both happen to be Red-Dane-Jersey crosses and they look a good deal alike. X-29 has a nice large, square udder and good general conformation while X-18 has a decidedly unbalanced udder and is not so 'good' otherwise. Yet she has that indescribable something which caused her to produce $100 worth more of the product than the 'typier' X-29.

"I think it is practical to use cross-breed technique for breeding replacement heifers in commercial herds. They should be used with proven sires of each breed. The question has been raised that everyone can't do this; 'there are not enough proven-for-production bulls to go round.' This fact, which must be admitted, only emphasizes the fact that the breed associations and their members have emphasized pedigree and type to the neglect of the scales and tester.

"As Mr. Prentice says in his *American Dairy Cattle*—'if a bull has a group of daughters producing more than their dams, that's all I need to know.' What some remote ancestor did or what some judge of type thought is irrelevant and of questionable value."

Mr. Strickler continues, "In my humble opinion the purebred industry—beef cattle as well as dairy cattle—is in exactly the same position that corn and small grain were fifteen years ago. At that time acres of floor space at Iowa State College were given over to selecting the most beautiful, uniform samples of open pollinated corn, oats and soybeans without thought or even understanding of their economic value.

"It seems to me that the records of the cross-breed cows are unequaled by any other group of cows anywhere. By this, I mean *every* existing cow of the 'breed' has been tested and recorded; the published results do not consist of just a few good records here and a few there, selected from all over the country. This work represents the only fearless, constructive attempt to breed economic, high production milk cattle, regardless of the straightness of their rump, the placement of their spots of their milk mirror (escutcheon)."

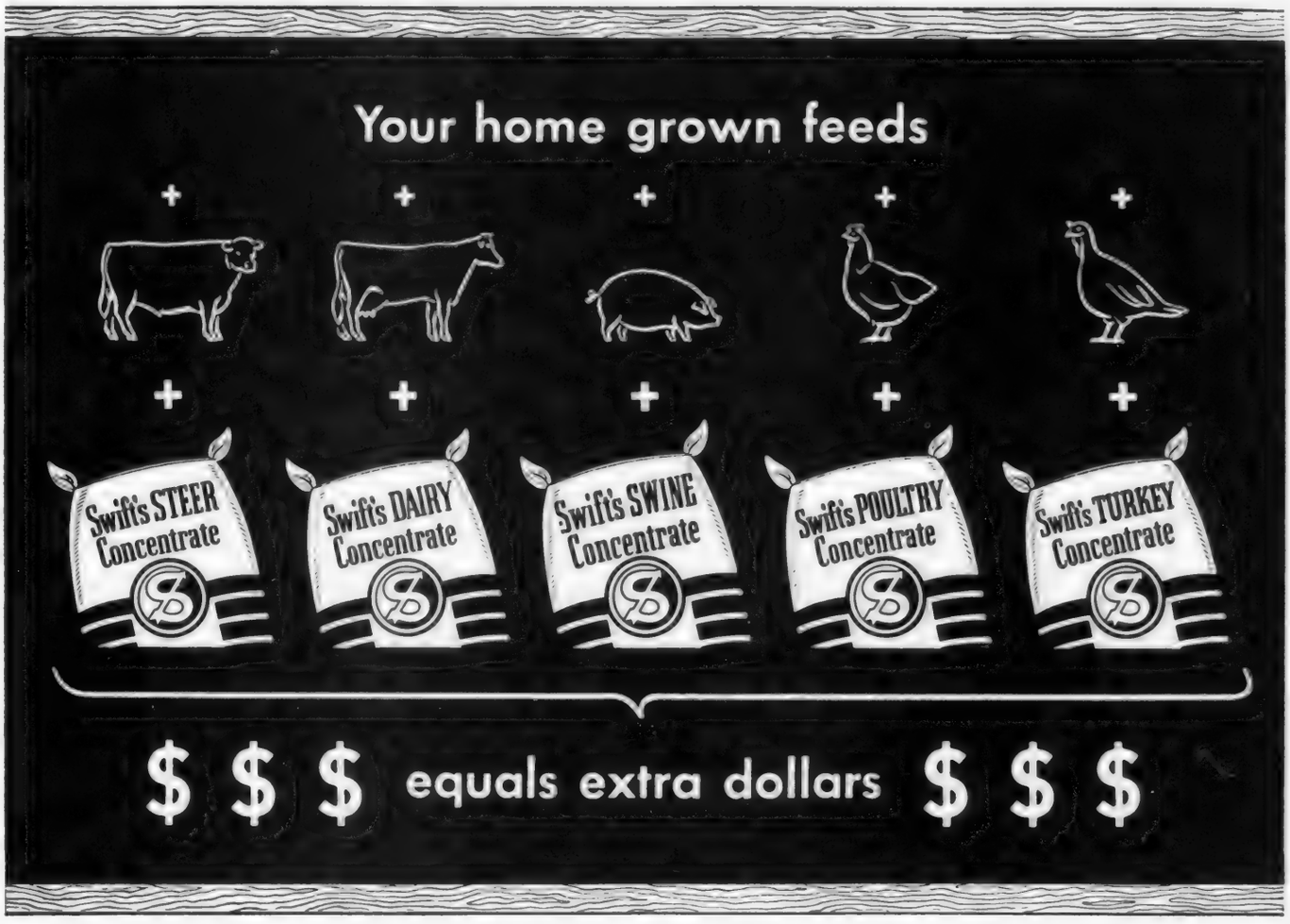
### Results at the Milk Pail

M. H. Fohrman likes to call the data that have been released on the cross-breed

(Continued on page 116)

IT'S FINE to find your bottle of milk on your door step each morning but it's much sweeter if one extracts it warm and fresh from the cow at the foot of the meadow. Give a man a white house on a hilltop, an elm or two on the lawn, a pig and a cow in the meadow, and freshly turned earth in his garden and the city dweller can have his pay check, his concrete sidewalk, and his smoky sky.

# Swift's Profit Primer


Your home grown feeds
Swift's STEER Concentrate
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All we're really trying to show on the blackboard above is that rations balanced with Swift's Concentrates pay off *extra*. Swift now offers you five feeds to boost your livestock and poultry profits. Swift's Swine and Poultry Concentrates have long been known as dependable and economical feeds. *Now* Swift also makes equally fine feeds for your beef cattle, your dairy cattle, and your turkeys.

Swift is a buyer of quality livestock and poultry. Hence it is to our interest to make feeds that help produce the kind of livestock and poultry we want. That's exactly what Swift Feeds do, and that's why it always pays to "buy the bag with the bars."

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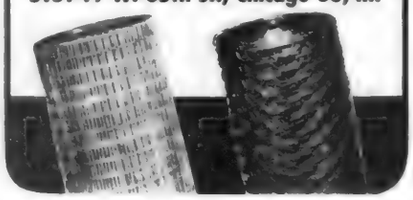



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The Early & Daniel Company
Cincinnati 2, Ohio
*Established in 1881*

**TUXEDO FEEDS**

FOR PROGRESSIVE FEEDING OF LIVESTOCK AND POULTRY


## RABBITS

(Continued from page 80)

her in breeding position with a hand placed in front of her, you will have to hold her with both hands.

### Easter Bunny Business

Watch your calendar and breed as many of your does as possible to have young for the Easter business. These should be about six weeks old at Easter time and should bring from a dollar to a dollar and a half. Easter gift rabbits are some of the most profitable rabbits you will raise, so it will pay you to watch your calendar and breed these does 10 weeks before Easter. These youngsters need not be perfect show animals and your odd colored stock will sell easily to Easter customers.

### The Young

Good healthy does will usually kindle from six to ten young. Anything between this number is a good average. A few heavy producers have been known to have up to 20 in one litter. This is more than one doe can handle; the doe is better off if she has six or eight.

The young will be born 31 or 32 days after breeding. On the 27th day you should place in her hutch a nesting box half filled with clean straw. A few hours before her time she'll pull fur out of her own body and line the nest. Keep her as comfortable as possible and don't worry if she cuts down on her feed. Usually her litter will come at night. She may be restless for several hours afterward and shouldn't be molested until she has quieted down.

After the doe has settled down you can satisfy your curiosity and inspect the litter. The blind, hairless young will be hidden by fur and straw. Inspect them gently. The one thing you want to learn is how many young she has. If you are raising rabbits commercially, you shouldn't leave more than eight with one doe. For show animals this is too many and the litter should be cut down to five or six. If you have no other doe with a litter about the same age, kill the extra or deformed young to cut the size of the litter to the right number. It is possible, however, to put the surplus out for adoption by another doe who has a small litter. The litters can be divided within the first two days after birth.

"Rabbits judge by smell," says F. J. Walters, an Ohio breeder of purebred Chinchillas. "If strange young are added to a doe's nest you may come out the next morning and find them all dead. We get around this," he added, "by greasing the doe's nose with Vick's salve. Then she can't smell anything but Vick's and the foster young are safe."

Another common way to outguess nature here is to take the young from the nest and carefully wipe off all the mother's hair that is sticking to their


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Yes, the records prove it! **Corriedales** give you more meat, more high-quality wool—are hardier, longer-lived, more prolific and thrive under less care.

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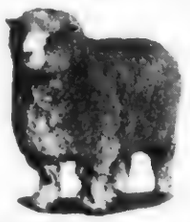

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The Record this year is providing eighteen Futurities in State Fairs and National Shows—nine of $1,000 and nine of $300, with $245 in special prizes in each. Its liquid assets (U. S. Bonds and Cash) total more than $60,000.

For hogs, copy of breed paper and literature, write:

**THE NATIONAL SPOTTED POLAND CHINA RECORD**
Fred Obenchain, Secy.-Treas.
5153 Kenwood Ave., Indianapolis 8, Ind.

red naked bodies. Then reach into the nest of the foster mother and get some fur from her nest. Rub this over the youngster's body and stick him in the nest among her own. She won't know the difference.

If a doe kills her own litter for no apparent motive, she may be getting a poorly balanced diet, or perhaps she was disturbed too soon after kindling. If a good doe kills one litter, grant her leniency. If she kills the second, return the favor and sell her for meat.

Young rabbits should be weaned at eight weeks. The doe will usually nurse for about this length of time, and the young should get the benefit of all the milk she will produce. They get a better start than if they are nursed for shorter periods and at weaning time have become accustomed to getting nearly all their feed from the crocks. To prevent the doe's milk from caking, wean her young away from her gradually.

The doe can be bred when the young are six weeks old, or two weeks before they are weaned. This keeps the doe averaging four litters a year, which is about right for a commercial rabbitry. If she gets in poor condition, give her a couple of weeks off to recuperate.

Sex the young at weaning time and put them in separate pens. To determine the sex, press the sexual opening apart with the fingers. This opening on does is a longitudinal slit, and on bucks it is round, and the male organ can be made to protrude. The bucks should be separated at 12 weeks to keep them from killing each other. The young does can be left in the same pen until three or four weeks before you plan to breed them, or until they are butchered for market.

### Rabbit Feed

Rabbits eat hay, grain and salt. It is generally best to keep all of these before them all the time and let them decide how much they can eat. Dumb animals, unlike us wiser humans, have a gift for choosing the foods they need. If your stock is adding weight too fast for breeding purposes, you can vary the composition of the grain mixture rather than feed less of it.

The hay should be good, green, leafy alfalfa of the third cutting, if possible. This hay sells for about 30 to 33 dollars a ton and gives rabbits a cheap nutritious feed which they enjoy. Mouldy and overcured hay cuts into your profits.

Most rabbit raisers feed commercially prepared pellets which can be either complete or grain pellets. The complete pellet has the alfalfa hay in it and requires no additional roughage. The grain pellet contains no hay and must be fed in conjunction with alfalfa or clover. Current prices for the complete pellets are about $4.60 a hundred, while the grain pellets sell for about $4.75. If you have your own hay or can buy it for


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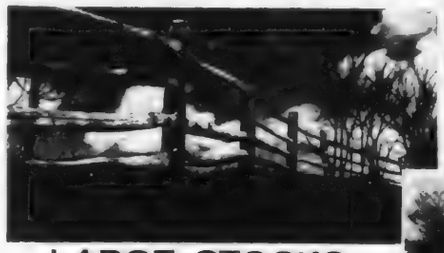
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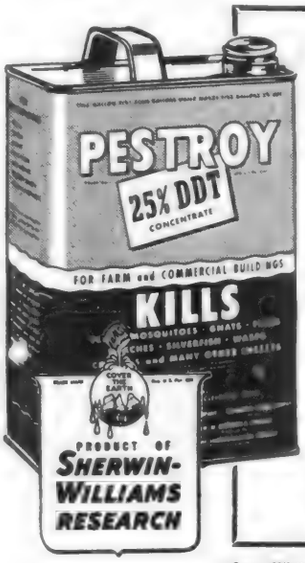


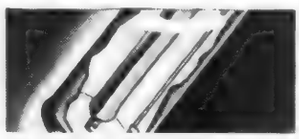

**UNIFORM APPLICATION STRENGTH!** Ordinary DDT settles, cakes at bottom of container, gives uneven spray. Pestroy remains in suspension, gives *uniform* DDT application throughout spraying!

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SOLD AT FARM SUPPLY, SEED, HARDWARE AND PAINT STORES


less than a dollar and a half a bale, you can save on your feed bill by feeding the grain pellet and keeping hay in the manger.

If you prefer, you can mix your own grain feed. A good standard grain mixture, according to Dr. Clarence R. Cole, Department of Veterinary Medicine, Ohio State University, is 25 pounds each of corn, wheat, oats, and soybean meal. "This is a mixture," he points out, "which will fatten young and yet keep breeding stock from getting too fat." To enrich this feed, add to the soybean meal and cut down on the oats.

Salt should be available constantly. It can be purchased from feed stores in small spools that can be nailed or wired to the inside of the hutches. These sell for a nickel each and last a year.

Rabbits drink a lot of water and need fresh water all the time, especially during hot summer months. In winter time, they can be watered a couple of times a day and the crocks can be emptied to prevent freezing. In California they use an automatic water device controlled by a valve, which the rabbit releases by pressing with his lips.

Greens are natural rabbit foods and domestic rabbits eat them with gusto. Everything from bluegrass to celery makes good dessert on a rabbit's menu. If your stock isn't used to green food, start them on it cautiously, for like a cow they can bloat and die.

Fryer stock that is preparing for a trip to market should be developed fast, to weigh about three and a half to four and a half pounds at eight weeks. They will dress away about 50 per cent of their live weight. These young are left with their mothers until time to butcher them at two months of age. This saves hutch space and gets bigger returns from the doe.

Older rabbits that have served their purpose in the herd can be fattened out by full feeding, and sold for roasters. They dress to weight about 55 or 65 per cent of their live weight, and should weigh around five to seven pounds dressed.

### Returns that You Can Expect

You can figure that each of your breeding does will bring you a profit of $15.00 a year. She will raise at least 20 young for market each year. These will average four pounds live weight at two months of age. They dress away half, making a total of 40 pounds of dressed rabbit meat going to market for each working doe. The price of this meat today is 60 cents a pound. This makes an annual meat income of $24.00 per doe. White furs will average 30 cents each on the market and this adds another $6.00 to your income. Subtract from this $30.00 total the cost of feed.

Assume that you are feeding complete pellets. They will cost you 4.6 cents a pound, and it takes about three and a half pounds of feed to make a pound of live rabbit. For each four pound rabbit, this is 14 pounds of feed which cost you 65 cents to feed a rabbit to fryer size, or a total of $13.00 to raise the year's production of twenty to salable age.

There will be two weeks for each litter when the doe is without young and the cost of her feed for these periods should be added. Forty cents worth of feed will last her for two weeks. Multiply this by four and add the $1.60 to your cost of production. Don't figure the cost of the doe's feed while she has the young with her, for then she uses most of the feed and the young get it as milk. When you subtract the total costs of $14.60 from the total income of $30.00, your profit will be $15.40 per doe.

There are, of course, other factors which enter into the whole picture. On the cost side will be such incidentals as hutch upkeep, broken crocks, salt spools, and perhaps some medicines. To bolster the profits, however, you can count on bigger litters, sale of dried manure, special sales such as breeding stock and laboratory rabbits. You can feed grain pellets and buy your own hay to save on feed bills, or when you raise your own grains you can cut costs sharply.

### Sanitation Makes or Breaks You

Start early in your rabbit business to keep your hutches and equipment clean. Good sanitary practices are as important in rabbit management as they are in other types of livestock farming. The construction of the hutches will have a lot to do with keeping them clean. Dropping pans and hutch floors should be cleaned every few days and should never go as long as a week. Disinfect

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***Belong in your Home Garden***

Separate and apart from the commercial interests of your farm—large or small—your HOME Garden is very personal, showing the individual tastes of the wife and children. DWARF FRUIT TREES are fascinating. Growing only 6 to 8 feet high, Semi-Dwarfs, 12 to 15 feet high at maturity, they bear full-size fruit. They take little space, and are easily cared for . . . APPLES: Choicest European and American varieties all grafted on true Malling Stock. Also:

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**APRICOTS, NECTARINES**
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them once a week, and at the same time dip the crocks in a bucket of water and disinfectant, followed by a rinse.

Rare is the rabbitry that never has a disease. The main diseases that are likely to trouble your rabbits are snuffles, coccidiosis, indigestion, infection of the reproductive organs, and malnutrition.

There are other rarer rabbit diseases that may crop up from time to time. The Government has printed a bulletin on Diseases of Domestic Rabbits, which is available for 10 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

### Marketing Your Rabbits

About all the equipment you will need for the slaughter are a skinning knife, fur stretchers, some clean utensils and water. To kill a rabbit, hold his hind legs in your left hand, place your right thumb behind his ears and your fingers beneath his chin. Push down to stretch the animal's body; then while pushing down with the thumb, snap the head back to dislocate the neck. You can kill them just as quickly by holding them by the hind legs and hitting them lightly behind the ears with a piece of broom handle.

Hang the rabbit from a hook stuck through a tendon on one of his hind legs. Cut the head off first to permit good bleeding. Bleeding is important in cleaning rabbits because the meat should butcher out white; thorough bleeding helps keep it this color. Cut the tail off, and also the free hind leg at the hock joint. Then cut the skin around the other hind leg just below the hock, and connect the two hocks with an incision on the inside of the legs. The skin can then be carefully separated from the meat and pulled down over the animal's body like a suit of underwear. Leave the fat on the carcass as you skin the rabbit.

Any small cuts on the skin are cuts on your profit. Be careful in handling them, and as soon as they are free of the rabbit, put them on wire stretchers. Fasten them with a clamp type clothes pin on both sides, top and bottom. They should be stretched smooth, but not too tight, and then hung free until completely dried. Wire stretchers can be made from number 6 galvanized wire. Bend the middle of a four foot length once around an inch and a half pipe to give it spring.

The carcass can be taken to market whole, skinned and nicely cleaned, or it can be cut into pieces and packed into boxes. Eating-size cuts are growing in popularity with grocers, growers and housewives. Packing boxes can be obtained from some feed dealers and rabbit clubs. One big advantage of this box is that rabbits too big for one family can be cut and sold in two parts. The rabbitry name and the weight of

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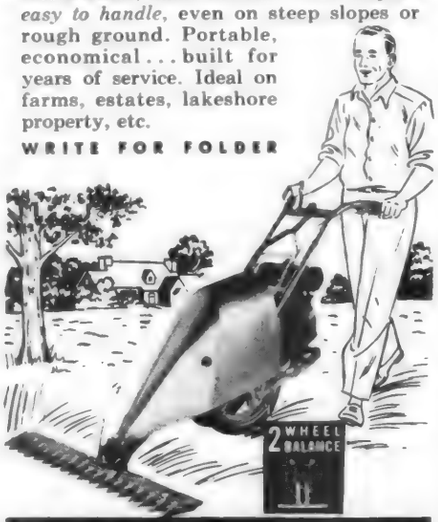


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the meat should be placed on each box. Some rabbit raisers have quick freeze units and have frozen dressed rabbit ready for customers when they call.

The fur of any rabbit is salable. The furs that bring the highest prices are, of course the large dense white ones with a good crop of guard hairs. If you kill a rabbit when he is shedding fur, you will get less for his coat.

A young rabbit's fur is never well developed until he is three and a half or four months old, and fur buyers suggest that they be fed until that time, but most breeders have found that the money invested in feed for those extra weeks seldom is returned in fur checks. For this reason, they kill the rabbit at the right age for frying and take what the market offers for the fur.

Rabbits shed their fur three or four times a year, and when killing old rabbits it is usually profitable to keep them until their fur is prime.

Store fur in mice-proof boxes and sprinkle with naphthalene flakes or PDB.

There are several grades within one color of fur and the prices run the gamut. Top price for a white fur is around a dollar and a quarter, with the fur of fryers averaging 30 to 35 cents. Chinchillas may go as high as $1.15 and fryers average 30 cents. Tops for a red fur is about 90 cents, with fryer sizes averaging 25 cents, and mixed colors bring top prices of 75 cents and a 20 cent average for fryer furs. Between these extremes are several grades.

Learn how to grade your furs and ship them in batches of similar quality. Otherwise you may get a price for all of them computed on the value of the poorest ones. It is best to keep your furs until you get enough to pay for packing and shipping them.

### Sell The Manure

Manure is a rabbitry by-product that finds a ready market. When dried and ground it can be sold to florists, nurseries, and gardeners, at $4.00 to $5.00 a hundred pounds, or sold wholesale to dealers at $60.00 to $70.00 a ton.

### A Hobby or a Business

Whatever phase of the rabbit business you enter, start from the beginning with a set of records and keep them up to date. These can be set up on file cards or ledgers. When you get a large herd of rabbits you will use your records a dozen times a day, and would be lost without them.

Most rabbit breeders today are small scale operators with a few hutches. Their rabbits are a hobby, or a source of family meat. But they know that if it were necessary they could make rabbits a full time job.


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National Band & Tag Co., Dept. 6-494, Newport, Ky.

(Continued from page 97)

leaving the straw to be plowed under. Short rotations seem to give the best control of grubs and wire worms. Some growers use the same rotation, but extend it over three years, cutting the clover for hay the second year. Only on muck soils or fertile sandy ones where an early crop is harvested in August and sown to rye by the first of September are the potatoes grown year after year.

The trend in rotations is away from the lime loving crops, sweet clover and alfalfa, to the less lime loving ones, mammoth, red and crimson clover and the non-legume crops, rye, rye grass and barley. The shift is largely due to the extensive and fibrous root growth of the latter grasses.

### Fertilizing the Crop

It is common in the east to use 2000 pounds of fertilizer per acre for potato land. The amount of fertilizer is reduced as the acreage moves to the far west to the volcanic soils, which are not yet regularly fertilized. The common practice of growers in the central states is to apply 500 to 1500 lbs. per acre, depending on the soil type and the courage the farmer has in opening up his pocketbook for fertilizer.

No one fertilizer analysis will fit all potato soils. The most common mixtures are the ones containing 4 to 6% nitrogen, 8 to 12% potash, for upland soils; on the mucks, nitrogen is usually omitted. Because most muck soils are high in nitrogen, but extremely low in potash, a good formula is 0-9-27.

Manure is an excellent source of fertility for potatoes. When used, growers reduce their commercial fertilizer by 50 to 75 lbs. for each ton of manure applied. The manure is applied in the early winter to the cover crop to avoid seed contact with fresh manure, which favors the development of scab.

Tests on the placement of fertilizers have shown that the most effective method of applying fertilizer for potatoes is in a band on each side of the seed piece about 2 inches away from the seed piece and on a level with or slightly below it. Modern potato planters are built with fertilizer attachments to approximate this placement. The application of all the fertilizer is made in the row at planting time to save labor.

### Trends in Production

The small potato acreage is getting smaller and the large acreages larger. This is due to the high overhead of producing potatoes. Small acreages will not support the high cost of special equipment—digger, planter, sprayer, sizing machine—which can be used on most farms for potato production only. Some of the smaller growers have solved their problem of overhead by following the practice of the old threshing ring: 3 or 4 farmers will own potato equipment cooperatively, thus spreading the cost over a larger acreage.

One of the best cooperative potato-growing groups is one organized by Virgil Royer of Arcanum, Ohio. He has helped solve the machinery problem for his neighbors. In 1928 he bought equipment and grew 10 acres of potatoes. He found his equipment capable of use on greater acreage and interested his neighbors in growing potatoes. He brought in certified seed, loaned his planter and digger to his neighbors, sprayed their potatoes and offered to sell their crops. As more growers became interested in potato production he purchased additional equipment for lease and began to do custom spraying.

### Costs—Profits—Labor Factors

Most growers in the central states figure present costs of growing an acre of potatoes, without irrigation, at $150.00 per acre. It requires 100 or more hours of man labor—about 80 hours for growing, the rest for harvesting, picking and marketing. Outside of labor the largest single cost is seed potatoes. From 20 to 25 bushels are required to plant an acre and the cost of seed is around $60.00. Where the potatoes are stored, 20 to 25 cents per cwt. must be added and a charge of 16 cents per cwt. is figured for containers.

Average yields in the corn belt of about 100 bushels do not make a profit even in the highest price years and in most years growers figure they must dig 200 bushels per acre to break even.


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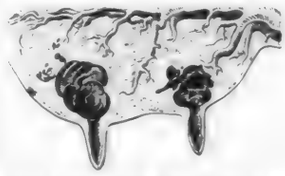

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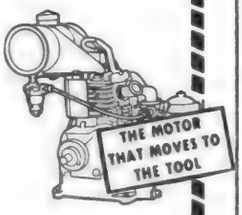


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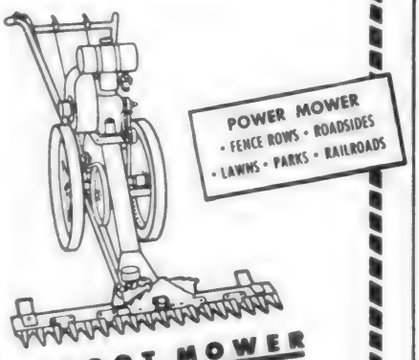


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### Growing the Idaho Potato

The reputation of the Idaho potato is based upon the Idaho Russet, or Netted Gem variety. It's the famous "Idaho Baker" you order in the best restaurants and pay a premium for at the corner grocery. The Idaho Russet makes up more than 90% of the commercial crop produced in Idaho. It requires the cool nights, even moisture, and a light soil. It won't tolerate hot nights and attempts to grow it in the middle west have resulted in mis-shapen, knobby, inferior spuds. All of the commercial Idaho "Russets" are grown in Idaho under irrigation. Most of them are grown at elevations of more than 4000 feet and on light, sandy loam soils. At these elevations in the mountain valleys nights are always cool.

### Potato Production in Maine

What cows and Republicans are to Vermont, potatoes and Republicans are to Maine. And when you think of Maine potatoes you think of northernmost Aroostook County, where the bulk of the Maine crop is produced. Out of every dollar of cash pocketed by Maine farmers from the sale of agricultural produce, forty-one cents ordinarily comes from the sale of potatoes. The whole economy of the state as well as the economy of all U. S. potato areas is affected by Maine's normal 46 million bushel crop. The fact that 13% of all potatoes produced in the United States are grown in Maine indicates how importantly Maine looms up in the national potato picture.

### Preparing Seed

Potatoes to be used for seed are taken from storage and warmed for several days at 50 degrees or above until sprouts begin to show. This hastens both come-up and maturity. Warming seed has replaced green sprouting where seed was placed in light or sun until short green sprouts appeared.

Do small potatoes produce small ones? Frederick, the Great, in royal circulars in 1756 on the cultivations of potatoes, said, "If you plant small potatoes, you will reap small potatoes." His Majesty was wrong. A small tuber taken from a disease-free hill will produce as well as a cut seed piece from a larger tuber. Seed sized for cutting two, three and four pieces per tuber is now offered for sale.

Many growers use home-made cutting boxes to facilitate cutting. This gadget consists of a sloping bottom hopper to hold the potatoes so that the tubers are fed to the operator through a small opening. In front of the hopper a thin knife sharpened on both edges is placed into a 2" x 4" which is fastened to the hopper, or a hack saw blade sharpened on both edges is fastened between two 2" x 4"'s.

Seed pieces cut blocky, averaging 1 to 1½ ounces and containing one or more eyes, prove most economical. Tubers weighing 2 to 3 ounces are split by draw-

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ing the tuber through the knife; on those weighing 3 to 4½ ounces, the stem end is cut off and dropped and the bud end turned and pushed toward the hopper, splitting it; 5 ounce tubers are cut from bud end to stem end and then once through the middle.

Large tubers, especially Katahdin and Chippewas, have few eyes in the basal half of the tuber and considerable waste results when cut. The amount of seed required to plant an acre not only depends on the distance of planting but size of the seed to be cut.

The most common method is to cut the seed and plant immediately; however, seed is sometimes cut ahead of planting and healed. When the early crop is planted little care need be given the seed because the seed pieces rarely rot in the soil, but when the late crop is planted, freshly cut seed, especially the Rurals, should not be exposed to drying winds or direct sunlight. In about 15 to 20 minutes on a hot sunshiny day the exposed cut surfaces turn dark and many of the pieces rot.

The healing or suberizing of cut seed enables the planter to utilize his labor on rainy days or during slack periods. Suberized seed is just about as good as small whole seed. To properly heal seed cut it and put it in crates until they are half filled. Place the crates so that air can circulate through them. The seed is held at a temperature of 60 degrees F. and the humidity about 85 degrees for a period of ten days. When these potatoes have stood for about 24 hours, pour them from one container to another to break apart the seed pieces which have stuck together. Temperature and humidity can be maintained by keeping a fire in the storage and a container of water on the stove.

### Other Uses of Potatoes

In northern Europe where about 90% of the total world production of potatoes is grown (in some countries more than 30 bushels per capita) they are used for making starch and alcohol in addition to human food, because grain is scarce. Potato starch has been a by-product in Maine for many years, the starch factories operating in large crop years when prices are low. Potato starch has several uses. Since it must compete with cheaper grain starch it is manufactured in limited amounts.

**Estimated Cost of Producing an Acre of Potatoes, 1946**

| | |
|---|---|
| Land Use | $ 10.00 |
| Seed 22 bushels ($2.40 average cost of seed) | 52.80 |
| *80 Man hours growing @ $ .50 | 40.00 |
| Fertilizer 1500# | 28.00 |
| Spray material (12 spray—200 per spray) | 24.24 |
| Machinery depreciation and fuel | 39.00 |
| Cover crop drilling and seed | 10.00 |
| | $204.04 |

*Includes hauling and handling fertilizer, seed, etc.

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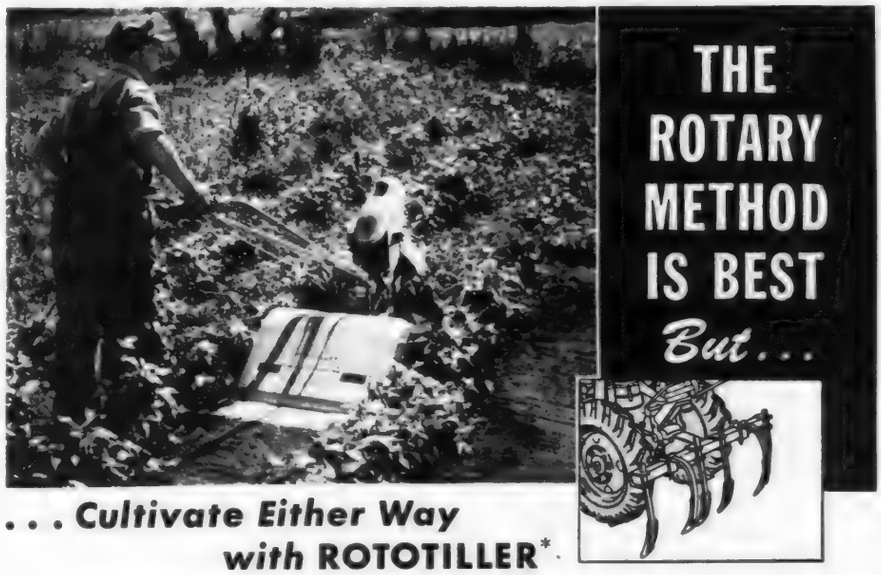


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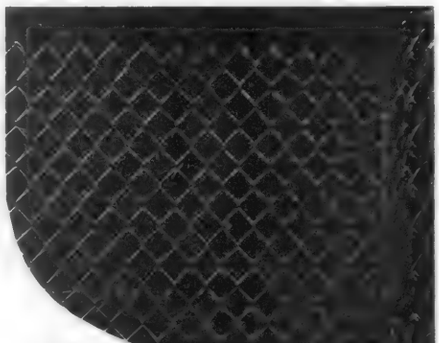

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## BARNYARD GOLD

(Continued from page 101)

stead of a manure pile in the open (or under the eaves) is evident when we know that about one-half the ammonia and potash in manure are water-soluble and are easily washed away by rain. The loss of urine means a heavy loss of nitrogen upon which bacteria feed. If bacteria can't get enough nitrogen from the manure, they take it out of the soil and thus steal it from the plants. Eventually, the nitrogen will be returned, but the plants may be harmed during the first weeks after manure application. Thus, with straw bedding, precautions should be taken to preserve the urine, or apply manure at least several weeks before plants are to be set out or seed sown.

### Applying Manure

The most efficient use of manure calls for collecting, spreading and discing into the fields as soon as possible. Manure in an open feed lot will lose half of its plant nutrients in three months, and there will be losses unless it is mixed with the soil.

Of course you can't spread and disc every day of the year. Whether you apply manure rotted or fresh, however, it's wise to add superphosphate to supply the nutritive elements lacking in the manure and thus provide a balanced plant food. Some farmers spread a layer of rock phosphate over the manure in the pit every few days, but superphosphate is best.

Rotted manure is sometimes practical. For example, it is well known that heavy applications of rotted manure to a garden may show more favorable results than the same weight of fresh manure. It must not be forgotten, however, that the rotted manure has been formed at the expense of considerable solid matter as well as loss in nutrients and actually represents more than twice its weight in fresh manure. The nutrients are concentrated but not increased, and the organic matter lost in rotting is a serious loss.

The great advantage of rotted manure is that it contains sufficient nitrogen for the bacteria to feed on, as was said before. If bacteria can't get this from the manure they get it out of the soil, robbing the crop. If they can't get it at all, they die, leaving what the dirt farmer calls "dead soil."

Fresh manure does not actually "burn" plants as would happen with strong acid or alkali. (Urine is neutral as it leaves the animal and soon becomes mildly alkaline.) Fresh manure does its harm by stealing nitrogen from the soil to the detriment of the plants. Later when the carbohydrates of straw or cornstalks are rotted, of course, nitrogen is released. If the soil has a stock of available nitrogen, fresh manure will do no harm.

When it's all said and done the best manure management is to spread it as soon as it is dropped and disc it in. If you can't do that, cover it and let the stock pack it


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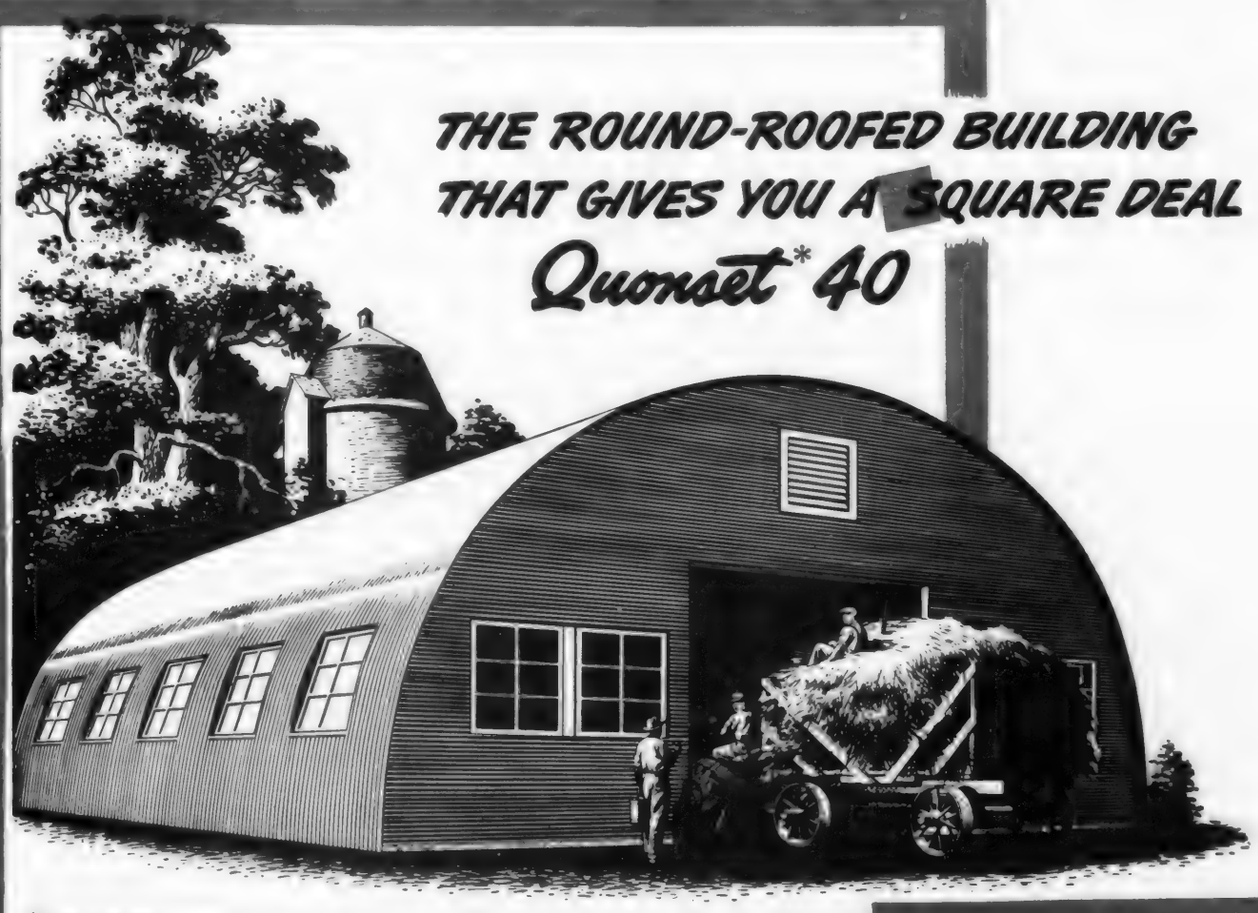

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The sturdy, durable Quonset 40 is a *big building*, built throughout of quality materials and with proved construction methods. Yet its cost is remarkably low for the value it gives you. Great Lakes Steel Corporation's efficient mass production of the Stran-Steel arch ribs makes possible important savings that are passed on to you. The Quonset 40 compares favorably in price with buildings made of less durable materials.

### A Square Deal in Permanence

Look at the advantages of *steel construction* in the way this building stands up. It is fire-resistant. It is weather-resistant. It is proof against termites and rotting. Where other framing materials may vary in strength and condition, the Stran-Steel framing of the Quonset 40 is always uniform in quality. Given reasonable care, your Quonset 40 should last indefinitely in A-1 condition.

### A Square Deal in Usefulness

The Quonset 40 is a very adaptable building. Its clear-span interior permits efficient use of all the space within, while variations in its length and in placement of windows let you adapt the Quonset 40 to your particular needs. Another important feature of usefulness is the patented *nailing groove* in Stran-Steel framing members: Any material or equipment that can be attached to a wooden structure can be attached to the Quonset 40, inside or out. You nail to Stran-Steel. See your local Quonset dealer for complete information—or send us a postcard requesting his name and address.

*Check these other "square deals" too!*

### Quonset 20

20 feet wide; length as required, in 12-foot extensions. Standard end wall equipped with walk door, two windows and ventilating louvers. Side wall windows and solid end wall also available.

### Quonset 24

24 feet wide; length as required, in sections of 12 feet. Each section permits choice of open front, solid panel or sliding door. Solid end wall or end wall with door and window available.

YOU NAIL TO STRAN-STEEL FRAMING

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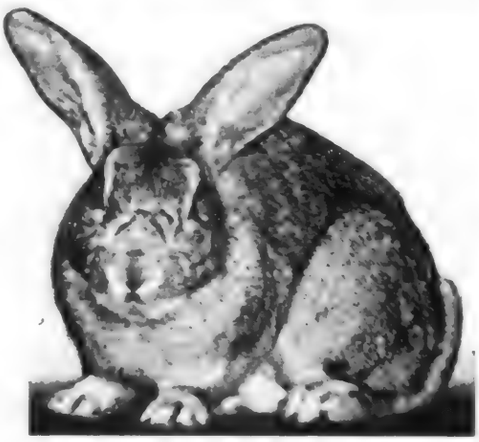
STRAN-STEEL DIVISION • DEPT. 28 • PENOBSCOT BUILDING • DETROIT 26, MICH. • UNIT OF NATIONAL STEEL CORPORATION

*Cash in on one of America's fastest-growing Livestock Industries*



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TENNESSEE TC CORPORATION
Atlanta, Georgia Lockland, Ohio

down, but remember you'll have a wrestling match when you try to dig it out.

### Relative Value of Manures

It is generally agreed that chicken manure is the "strongest" and that sheep, horse, cow and pig manure are next in order of effectiveness, based on a combination of solid and liquid excreta. Fresh chicken manure contains about 1½% nitrogen, .4% phosphoric acid and .5% potash. These percentages are a little more than doubled when the manure is air-dried.

**COMPARATIVE STRENGTHS OF MANURES**

| | Nitrogen | Phosphoric | Potash |
|---|---|---|---|
| Chicken | 1.5% | .4 % | .5% |
| Sheep | 1 % | .3 % | 1 % |
| Horse | .8% | .25% | .5% |
| Cow | .8% | .15% | .5% |
| Hog | .6% | .35% | .4% |

The low mineral content of barnyard manure and its lack of balance may make you wonder why it is used at all. One ton of average manure yields only 12 pounds of ammonia, 10 pounds of potash and 5 pounds of phosphoric acid, low indeed when compared with commercial fertilizers (above figures the equivalent of only 100 of 12-5-10 fertilizer). But other factors must be considered. Manure helps to build up the humus content of the soil, improves tilth and carries its value over into succeeding years. Some experimenters say that the value of manure in the fields extends as far beyond as it does behind, that is, if you have manured a field for twenty years, the effect, though diminishing after you stop, will be noticed another twenty years. Since manure is applied in ten-to-one greater quantities than commercial fertilizers and its total nutrients are considerable.

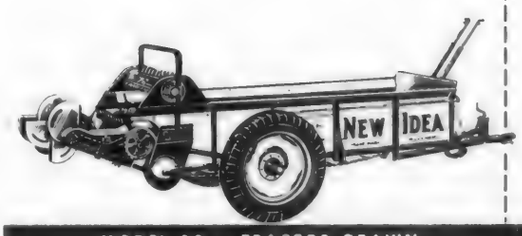
Wheat and certain other grain crops may lodge from the use of manure. If some crop such as corn is planted the same year the manure is applied, wheat may be safely planted following the corn. Tobacco, flax, and sugar beets, may decrease in market value if grown the same year with heavy applications of manure on naturally fertile soils, but will all benefit in succeeding years.

Results reported from a number of agricultural experiment stations indicate that the immediate value in increased crops from application of farm manure averages about $5.00 per ton. With crops yielding high returns per acre, such as truck crops, the return is double this figure. The cost of spreading manure is greater than fertilizer, the latter going on with the seed in most cases.

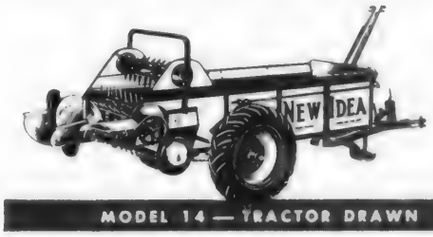
### The Economics of Manure

Every crop you grow takes a certain amount of fertility out of the soil and when you sell crops directly off your land, that fertility goes along on the truck which carries away your corn or soy beans or hay. It doesn't take a mathematician to figure out that if you

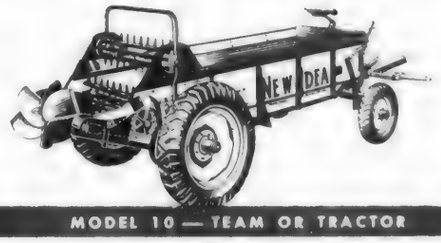
# NEW IDEA Spreaders




MODEL 12 — TRACTOR DRAWN




MODEL 14 — TRACTOR DRAWN




MODEL 10 — TEAM OR TRACTOR

Two wheel models for either large or small tractors. Four wheel model for both team and tractor. An efficient Lime Spreading Attachment is available which enables these machines to handle agricultural lime as well as manure. For information, see your NEW IDEA dealer. Or write our Coldwater office requesting free descriptive folders.

## *tested guardians of soil productivity*

Age old agricultural wisdom lies behind the use of manure on crop lands. Science has discovered nothing that restores both tilth and fertility more surely, quickly and thriftily. It is nature's own builder of soil productivity.

When applying manure to their fields, good farmers the country over show a decided preference for NEW IDEA Spreaders. Personal observation has taught them the unexcelled ability of these sturdy machines to shred thoroughly, pulverize finely and disperse evenly so as to assure full extraction of all values. They likewise know that long time NEW IDEA experience in spreader designing, plus quality workmanship, make certain always of easier operation, greater durability and maximum economy.

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**FARM EQUIPMENT COMPANY**

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MANURE SPREADERS • PORTABLE ELEVATORS
HAND CORN SHELLERS • SIDE DELIVERY RAKES
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"HIDDEN HUNGER"

Will today's young stock be tomorrow's top producers and reproducers? Or, will they be sickly, broken down critters that don't earn their keep? One *proven* way to protect their health and future productivity is to insure them against the ravages of:

***"HIDDEN HUNGER"*—Lack of essential mineral elements needed by livestock for sturdy health, rapid growth, peak production and reproduction.**

You can safeguard your young and dry stock, milch cows and beef cattle against health and profit-robbing "Hidden Hunger" by regular, year-round supplementary feedings of Near's MinRaltone. MinRaltone is the deadly enemy of mineral deficiencies because it contains *11 Hidden-Hunger-Fighting* mineral elements needed by livestock for top health, sturdy growth and peak production and reproduction. Decide *now* to safeguard your herd against "Hidden Hunger." Write for the MinRaltone Plan of supplementary feeding.

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NEAR'S

MINRALTONE

MINERAL FEED SUPPLEMENT

for HEALTH
PRODUCTION
PROFITS


keep your crops on your own place and feed them to your own cattle, more of the fertility stays on the farm. If you take good care of all animal excretions and apply them to the soil, you get back as much as 80% of the potash, 70% of the nitrogen, and 75% of the phosphorus taken out of the soil by the plants.

Another thing worth considering is that the fertilizing value of the manure on your farm depends entirely on the feed your animals eat. Rich feed yields manure rich in plant nutrients. Poor feed gives you back less from the work you do in hauling and spreading manure.

The amounts of manure you can expect from various animals differ with feed, of course, but roughly speaking, a dairy cow yields fifteen tons, a fattening steer nine tons, a horse twelve tons in a year, and about one-half of this is available for spreading on the fields (the remainder is dropped on pastures or elsewhere).

These tonnages can be translated roughly into fertilizer equivalents by figuring one ton of manure as equal in plant food to one hundred pounds of 6-2-5 fertilizer. Thus a dairy cow gives in one year the equivalent of 1,500 pounds of 6-2-5 fertilizer, including field droppings. To balance the plant food in manure, add fifty pounds of 16% superphosphate to each ton of manure and you have the equivalent of 100 pounds of 6-10-5 fertilizer.

To give a working example of how to apply this to a typical corn crop, spread ten tons of manure plus five hundred pounds of 16% superphosphate per acre. A ready comparison between spreading just manure, and manure plus superphosphate, is available in an experiment carried on in Ohio. When eight tons of manure were spread per acre on a corn field, the yield was 34 bushels. When 200 pounds of 4-12-4 fertilizer was added to eight tons of manure on another patch, the yield was 55 bushels. (This is equivalent to ten tons of manure plus 150 pounds of superphosphate.)

It's impossible to offer any definite program for individual farms, but the above gives some indication of amounts to apply and should be varied according to your own local conditions of soil fertility.

## CROSS-BRED COWS

(Continued from page 102)

cattle a "progress report." He says, "Our thinking on cross-breeding, based on the results that we have had up to now, is that it might be potentially good, but without proper guidance it could be harmful. In this experiment, as in so many others that the Department of Agriculture carries on, it is our purpose to furnish some lead or guidance to set the proper pattern for this type of breeding. The work has now progressed far enough for us to say to the breeder, 'If you want to cross-breed, join an artificial insemination association and breed your cows to the best proved bull that is available.' Eight years ago, when we started our cross-breeding experiment, we didn't know that there would be so many breeding associations functioning. The work of the Department in that field along with other people has produced fruit for anyone who wants to try cross-breeding."

Elaborating on the way in which this might work out, Fohrman says, "The answer to the commercial breeder's question is about as follows: From his standpoint, the color of his cows is not as important as how well the herd produces and its persistence. If a commercial dairyman is able to join an Artificial Breeding Association, he finds it cheaper and easier to breed his cows than to own and maintain a sire on his farm, especially a young bull, that has not been proved. Usually, such rings have bulls of two or more


**COLD SATURDAY FARM**

PUREBRED ABERDEEN-ANGUS CATTLE

HERD SIRES:

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MR. & MRS. H. H. HACKNEY, OWNERS FINKSBURG, MARYLAND

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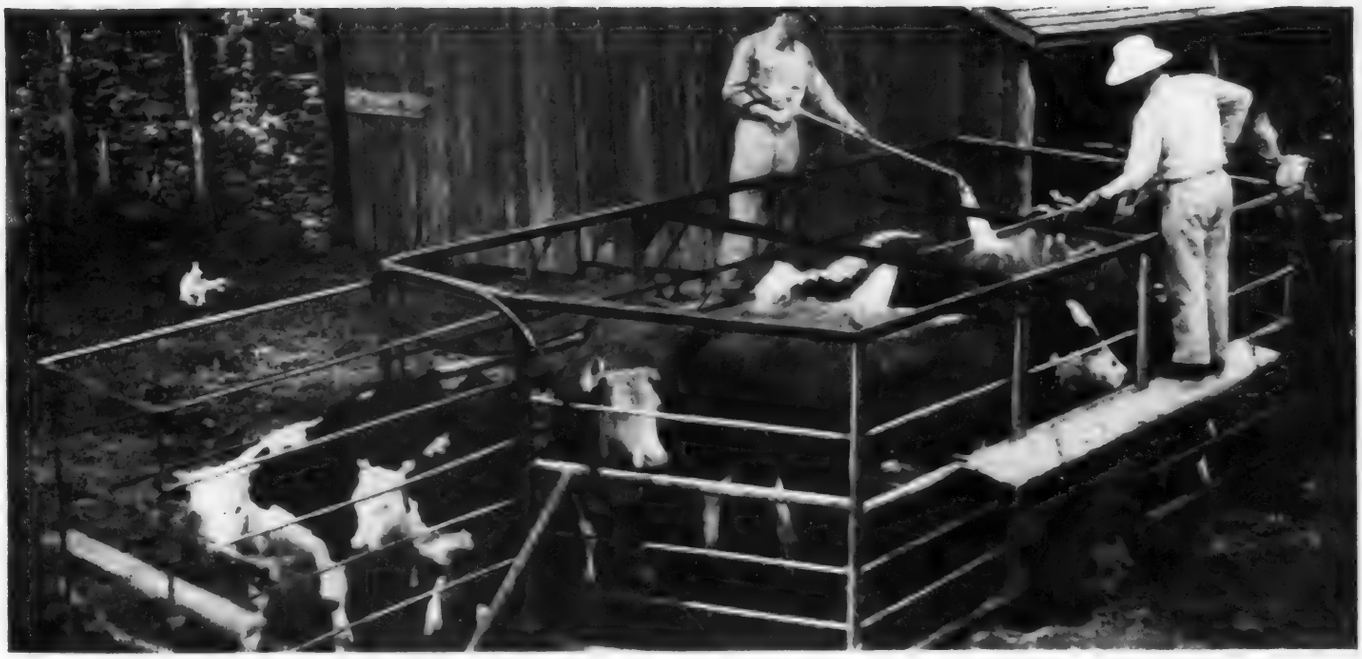
**AUTUMN ISSUE ON SALE**
**OCTOBER 15, 1947**

Farm Quarterly is on sale at all large newsstands. Ask your dealer to hold one for you.



**SPRAYING LIVESTOCK WITH DDT** is a new and valuable practice, as is application of DDT to control fruit and vegetable insects. In a Kansas fly control program (above) animals sprayed with DDT gained half a pound extra weight a day. Dairymen get up to a quart more milk a day from cows protected with DDT. A water spray of Du Pont DEENATE 50-W DDT kills flies, lice and sheep ticks.

# New Chemicals Bring Major Changes in Many Farm Practices

THIS may go down in history as an era of vast new chemical developments for agriculture.

Many new Du Pont products are now helping farmers and ranchers make basic changes that step up production and save work.

For example, Du Pont 2,4-D Weed Killer now removes some of the most destructive weeds from small grains, pastures and drainage ditches. Farmers have found Du Pont 2,4-D especially effective for weed control in oats, barley, rice, wheat and sugar cane. It also makes the grain easier to harvest by combine and saves loss of grain in straw due to green weeds.

One application of Du Pont AMMATE kills the toughest woody and deep-rooted weeds. It saves grubbing and chopping stump sprouts, poison ivy, poison sumac, brush and vines in pastures, orchards and fence rows.

DDT has also eased many farm tasks while it has increased farm output. Du Pont DEENATE DDT has given fruit growers outstanding control of codling moth and has increased potato yields as much as 100 bushels an acre. It has proved equally effective against other crop and livestock insects.

Likewise, Du Pont fungicides have made control of plant diseases easier and more effective. Full information on Du Pont chemicals for agricultural uses may be obtained by writing to the Du Pont Company, Grasselli Chemicals Dept., Wilmington 98, Delaware.

**DU PONT** *Pest Control Products*

**INSECTICIDES:** DEENATE* DDT, GRASSELLI* Lead Arsenate, NUREXFORM* Lead Arsenate, LEXONE* 50 (Hexachlorocyclohexane), Oil Sprays, KRENITE* Dinitro Spray, ALCOA** Cryolite, BLACK LEAF† 40 and 155

**FUNGICIDES:** ZERLATE* and FERMATE* Organic Fungicides, COPPER-A Compound, SULFORON* and SULFORON-X* Wettable Sulfurs, Bordeaux Mixture, Lime Sulfur, Flotation Sulfur Paste, KRENITE* Dinitro Spray.

**OTHER MATERIALS:** 2,4-D WEED KILLER, AMMATE* Weed Killer, Du Pont SPREADER-STICKER, PARMONE* Pre-Harvest Fruit Drop Inhibitor.

*Reg. Trade Mark of E. I. du Pont de Nemours & Co., Inc. **Reg. Trade Mark of Aluminum Company of America
†Reg. Trade Mark of Tobacco By-Products & Chemical Corp., Inc.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

DU PONT

# BREADY Garden Tractor Takes the Work out of Gardening

● Tough gardening jobs are a cinch with a BREADY Garden Tractor... all you do is guide it... ratchet wheels turn the BREADY "on a dime". The "Front-Hitch" method of power application—an exclusive BREADY feature—makes the tractor hug the earth, gives you 30% additional power and traction.

● Big 1½ H. P. motor uses only one gallon of gas in five hours. BREADY'S all-purpose attachments—hitched on in a jiffy—include: Plow, Cultivator, Disc, Harrow, Cutter Bar, Snow Plow.

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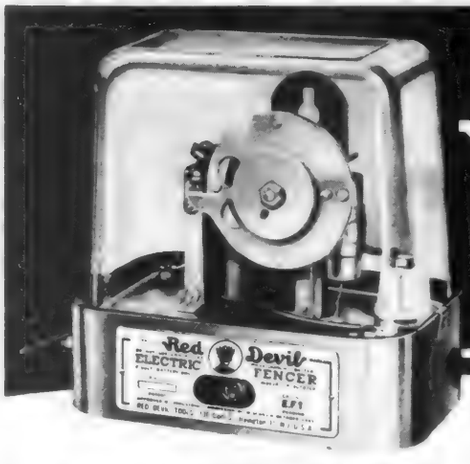


No. EF1 Battery Operated

# Genuine Red Devil ELECTRIC FENCERS

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RED DEVIL ELECTRIC FENCERS now are offered in two models. The famous EF1 battery model; and the NEW combination EF2 which permits either high line or battery operation.

The exclusive INTERMITTENT SHOCK is timed like a pulse beat—it greatly increases the effectiveness of the shock while eliminating the dangers of steady shock. This on-off, on-off action is controlled by a new "wheel" type contact (the only moving part) and thus current is only used instantaneously—centrifugal force does most of the work. Thus the RED DEVIL FENCERS are the least expensive to operate of any type.

Strong glass top (you see it work) is sealed to prevent tampering and bar elements. No radio interference. Nothing to oil or grease. Unconditionally guaranteed against defective parts and workmanship.

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**Red Devil Tools.**
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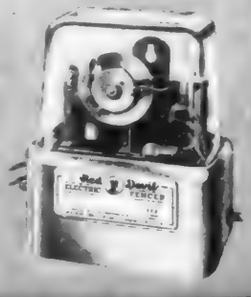


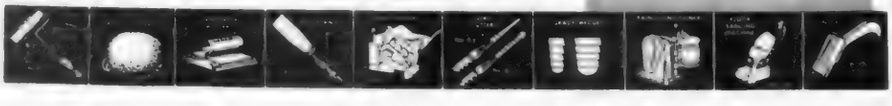


breeds for service. The dairyman finds out by careful comparison, or by consulting a sire index, which bull or bulls are best suited to his needs—the ones deemed best for transmitting uniformly good and persistent milk production, or a higher fat test.

"Knowing such facts about the bulls, he can make intelligent selection of the semen from the available animals. Perhaps he will buy semen from a bull of a different breed than his own cows, as it is results at the pail he is after. Maybe a Brown Swiss bull is the best one of the lot, the rest being too young or of less breeding value. So, he would thus disregard the particular breed factor entirely and think only of the germ plasm, or factors of inheritance that he hopes would give him the goal he seeks. Our own thinking is that the dairyman will get the best offspring by using the best bull available, regardless of breed. Good purebred sires would still be his mainstay, the new approach would be that they would be used in a 'rotation' system. That is, after he made one cross-breeding he would continue to cross-breed the offspring by using a bull of still another breed."

In answer to the question, "How could the commercial dairyman afford to keep several bulls for rotation breeding?" Fohrman said. "He would not be obliged to keep several bulls or cows of different purebred lines for his crossing work, as he would have had to do before the days of test-tube breeding systems became popular and practical. He would upset no breed rules or render no harm to the dairy industry. He would merely continue to improve his herd with the best inheritance available without 'drawing any color lines.' 'Merit' would be the basis of his judgment."

Plans like this are being tried; a Michigan cow testing unit is using a group of seven sons of the original Red Dane bulls imported by the Bureau of Dairy Industry to grade up herds of various breeds. The daughters of the first 7 bulls used for these matings all show plus signs on milk production over their own dams, except one. The best record made over the dams was 857 pounds of milk and the least was 60 pounds.

Purebred Association comment on the plan has been varied:

Karl B. Musser, Secretary of the American Guernsey Cattle Club, feels that no good can come from cross-breeding. He says, "For all of these years the important part of better cattle programs has been to get dairymen to see the error of cross-breeding. That has been the thing that kept the general plane of dairy cattle in America at a low level. If you will investigate the history of any real dairy country in the history of the world, their progress has been made because of the purity of breeds in their program. In fact, this country enjoys what progress it has made through the diligent adherence to selecting and improving the purebreds in the old country."

# ARO FARM LUBRICATORS

## *Safeguard Your Machinery*

## -SAVE MAINTENANCE EXPENSE

Protect farm machinery — and reduce maintenance costs — with *speedy, efficient* ARO Farm Lubricators!

For example, Aro Model 2160 air-powered Lubricator shown above is a great time-saver and work-saver . . . does the job *right!* Assures correct amount of grease for each fitting. Develops pressure 36 times the air pressure. Low air consumption. Dust-proof container. 60-lb. bulk capacity — pumps light or heavy grease. Holds 25-lb. or 50-lb. pail—operates without transferring grease from pail. Portable. Net weight 50 lbs. Sturdily built of heavy gauge steel.

Ask your farm implement dealer about Aro's complete new line of Farm Lubricators . . . outstanding in performance and dependability. The Aro Equipment Corporation, Bryan, Ohio.

HAND GUN. Lever-type Model 2030 Aro Hand Gun develops up to 10,000 lbs. pressure. Spring-primed grease chamber. Capacity 1 lb. Low priced Many farm uses.

ARO GREASE FITTINGS in new complete line of sizes and types. Accurate . . . dependable . . . for every lubrication point.

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IN THE AIR

OR ON THE GROUND

BUILT FOR THE JOB!

POWER BY Red Seal Engines CONTINENTAL

Year after year for more than four decades, Continental Red Seal engines have been furnishing reliable power for an ever-widening range of specialized applications. There's a Red Seal engine designed and built expressly for each of countless jobs in transportation, in industry, and far from least important, on the farm.

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C85 AIRCRAFT ENGINE *Is typical of the 8 engines Continental makes for personal and executive planes. They are reliable, moderate in cost, and deliver full power at low r.p.m.*

RED SEAL INDUSTRIAL POWER UNITS *are in wide farm use for pumping, hoisting, logging and generating current. These engines range from 5 to 140 hp.*

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MUSKEGON MICHIGAN

45 YEARS' SPECIALIZED EXPERIENCE BUILDING ENGINES FOR TRANSPORTATION, INDUSTRY, AVIATION AND THE FARM

HARVESTERS TRUCKS BATTERY CHARGERS


C. T. Conklin, Secretary of the Ayrshire Breeders' Association says, "Inasmuch as this Association through its magazine THE AYRSHIRE DIGEST has made no statement regarding the crossbreeding experiment at Beltsville, we must request 'no comment'."

Victor A. Rice, Dean of Agriculture at Massachusetts State College, and an outstanding geneticist, in reviewing the Crossbred Experiment, says,

"I have expressed my views on this crossbred matter in an article in HOARD'S DAIRYMAN of September 10, 1946, where I tried to point out that I thought the COUNTRY GENTLEMEN story, supposedly by Mr. Reed, slanted far too much credit towards crossbreeding and not enough towards the proved sires that were used. I have another story in HOARD'S DAIRYMAN in the May 10, 1947, issue on 'SYSTEMS OF BREEDING.' Obviously, if a man starts with fairly good inheritance in his cows and continuously adds good inheritance from a series of bulls, his herd will get better. Whether the bulls are of the same breeds or of different breeds, by and large, I believe will make little or no difference.

"The two original flaws in the U.S.D.A. figures still seem to exist. The first of these is the records of the dams of these crossbred animals. Where were the records made and under what conditions? I have a doubt in my own mind as to whether the records of the dams were made under as favorable conditions as those of the daughters.

"The second lacking figure is the actual data on the bulls. Mr Fohrman's original progress report says that 1 Holstein, 3 Jersey and 1 Red Dane bulls, all of them proved, were used, but there is data in this report on only the Holstein. The figures show that for the 40 two breed crosses, the composite bull index is 15,293 4.52 691; and for the 10 three breed crosses 16,763 4.18 700. If these were the indexes of the original bulls, then they behaved just as we would expect them in crossbreeding or straight breeding; the first pull-up half way to the index of the bulls, the second pull-up half the remaining distance, the indexes of the bulls remaining practically the same. I, personally, wish somebody would dig out these matters relating to the figures on the original cows and how they were made, and the indexes or the daugher-dam comparisons on the bulls which had been used. If we could get these figures, we might be able to check such statements as that of Mr. Reed that the crossbreeding resulted in a 30% greater than expected increase."

Part of the answer to Dean Rice's first objection is contained in the first lactation records of the foundation cows. These indicate the cows had good care at the outlying stations.

AVERAGE BUTTERFAT PRODUCTION RECORDS OF FOUNDATION COWS.
ACTUAL FIRST LACTATION RECORDS.

| | | Butterfat Pounds |
|---|---|---|
| | **12 Holsteins from Huntley, Montana** | |
| 10 | with first calf Huntley records average | 454 |
| 2 | with first calf Beltsville records average | 534 |
| 12 | average | 467 |
| 179 | first calf records made at Huntley average | 471 |
| | **13 Holsteins, from Mandan, North Dakota** | |
| 12 | with first calf Mandan records average | 514 |
| 1 | with first calf Beltsville record averages | 472 |
| 13 | average | 511 |
| 134 | first calf records made at Mandan average | 452 |
| | **11 Jerseys from Lewisburg, Tennessee** | |
| 9 | with first calf Lewisburg records average | 448 |
| 2 | with first calf Beltsville records average | 418 |
| 11 | average | 443 |
| 119 | first calf records made at Lewisburg average | 410 |
| | **13 Guernseys from Sandhill, South Carolina** | |
| 4 | with first calf Sandhill records average | 424 |
| 9 | with first calf Beltsville records average | 431 |
| 13 | average | 429 |
| 75 | first calf records made at Sandhill average | 450 |
| | **Summary of 49 cows from 4 stations** | |
| 35 | with first calf records at home station average | 470 |
| 14 | with first calf Beltsville records at Beltsville average | 446 |
| 49 | average | 463 |
| 507 | first calf records at home stations average | 449 |

The data on the bulls used, which Dean Rice considers the second flaw in the U.S.D.A. report, will be collected and published in a subsequent issue of FARM QUARTERLY.

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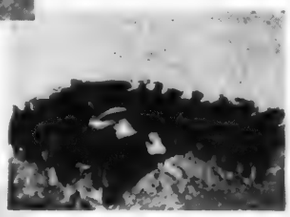

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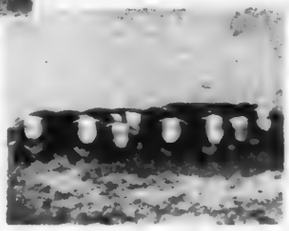

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## THE BRAHMANS

(Continued from page 53)

purpose: "Breeding better Zebu cattle and promoting better relations and understanding among all breeders of cattle, irrespective of the breed."

### Florida Brahmans

Florida, the original cowland of America, has been restored by Brahmans to third rank among the cattle producing states in the past ten years. With the improvement of pastures, the use of supplemental minerals for run down land and tick eradication programs, Florida is a better place for any breed of cattle today, but the Brahman bull which serves 60% of the commercial herds of the state, has, in the opinion of Nathan Mayo, Commissioner of Agriculture, restored the cattle industry of one of the great cattle producing states of the union. "With no increase in numbers," he says "the introduction of the Brahman into the Florida cattle industry has increased the poundage of four."

In 1945 registered Brahmans topped the list of all registered herds in Florida. From Dade County at the tip of the state to Union County on the north, the greater hall of Florida is dotted with Brahman cattle ranches. Ranging from 25 to 500 cows per ranch, there are approximately eighty registered Brahman herds in the state. Florida ranchers have traveled far and paid well for the best Brahman blood available, and, in a little over ten years' time, have built up splendid record-making herds of purebred registered breeding sires and grade cattle. When driving the Florida range it is not at all uncommon to see a six months old crossbred Brahman calf that outweighs its native mother.

A young Brahman bull for commercial herd service may be purchased for around $350.00 by a careful buyer, but a purebred registered Brahman sire costs from $1,000.00 to $4,000.00, and up. Some bulls and many heifers are not for sale at any price.

Beyond the sign, "Anthony Farms" near Ocala, the gates swing open to a 100,000 acre cow heaven consisting of three major ranches belonging to the Norris Cattle Company. Much of the land was purchased at a low cost. Dykes were built along the Ocklawawha River, trees and scrub were taken out and a variety of grasses sown to improve the pastures for the company's fine cattle and horses. Manager Bob Herrmann directs a breeding program which aims at a Brahman-Angus cross which can be fattened out to heavy beef steers. The company recently exported shipments of purebred Brahmans to Haiti and the Bahamas.

At Brighton, Florida, the Durrance Cattle Company has developed hundreds of acres of improved pastures and have produced outstanding herds of registered, graded up "Compact-Type" and "Tippu-Type" Brahmans.

The best management plan to up-grade the native herds of Florida seems to be to get as much Brahman blood into a cow herd as possible and then put a Hereford, Shorthorn, or Angus bull in the herd and let him go to town, adding their fine beef qualities to the stamina of the Brahman. The reason why this is preferable to placing a Brahman bull with a native herd is that the Brahman cow furnishes more rich milk for the calf and she is a far superior mother to the English breeds, protecting her calf against all comers under conditions that would discourage other cows.

### Pasture Improvement Too

If the up-grading of the native herds of the Gulf Coast states is to go into high gear, factors other than the quality of the cattle themselves will have to be given important consideration. One of these, not the least important, is an intensive breeding program to permit large numbers of purebred stock to be bought at prices within reach of the small operator. Going hand in hand with quality and low price must be a pasture improvement program for the whole region. In fact, the pasture improvement program should come first. This has been recognized on the King Ranch in Texas where important money is being spent on fertilizer and cultivation of pasturage. Here the old

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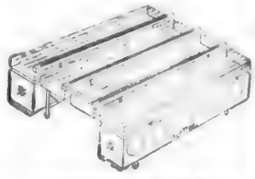

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### Brahmans In The Desert

Brahman cattle breeders, including the Gillespie Land Company of Gila Bend, Arizona, Wayne H. Fisher, Harold Hunt, R. Lee Pollard, Arthur Baker and Paul Cornelius, of the Cornelius Packing Company, all of California, proclaim a better prospect for the beef cattle industry in the heated, arid desert regions of the Pacific Coast.

From their original purchase of 2,000 Brahman cattle in Texas a few years ago, the Gillespie Land Company, of Gila Bend, Arizona, now pastures from 8,000 to 13,000 head of Brahmans on their 85,000 acres of irrigated desert pasture. Calves pastured on grass alone average 650 pounds at seven months. "Our Market," says Mr. Gillespie, "is Los Angeles," "and we top the market." "It is possible to handle these Brahman cattle with less time and one-third as much help as it takes to handle any other kind of beef cattle."

### In Northern Feedlots

Just what crossbred feeder stock produced in the South will do in northern feed lots is largely an unanswered question. With southern prices what they are no great exportation of feeder stock has been made to the North. There are a few animals going from Texas to Nebraska but the demand is far greater than the supply. The Nebraska feeders say they have done as well as the corresponding quality of the other breeds. It's generally believed that the Brahman and his crosses will do well in any climate under any condition on any feed. Twenty years ago the Ringling family took a carload of Brahmans to their Montana ranch. To this day the cattle that do best on that ranch have remnants of that Brahman blood in them. The King Ranch is now conducting experiments in Pennsylvania feed lots. A herd of Santa Gertrudis were taken to Pennsylvania a year ago for summer pasture. On grass this herd put on an average of two pounds per day. Another herd will be fed out through the winter on typical northern dry feed to determine their performance. Colorado has a great many Brahmans on mountain ranges. In the Pan Handle where winter conditions are as bad as anywhere, Brahman crosses dig their forage out of two feet of snow and do well. Brahman cows will drop their calves in the snow and protect them.

### How About A Dairy Brahman?

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dairy cow that will do well in that climate. Since they have licked the tick in Florida, Guernseys and Jerseys are not faring so badly, but even at that their production is 'way below that of the Northern states because of the humidity and the heat. By far more important than the improvement of the large commercial dairy herds of the state is the improvement of the family cow and the small herds. The native cow is now mostly Jersey, because the Jersey has fared better in Florida than other breeds. She is spindlelegged, pot bellied, boney, and won't average better than 600 pounds soaking wet when full grown. Mated with the Brahman bull, the native cow will throw a heifer calf that will outweigh her before she is a year old. The average butterfat content of Brahman milk is 7%. However, just what the right percentage of Brahman blood in the dairy cow should be and just what breed will produce best when crossed with the Brahman bull is a problem for the experimental farms and dairy breeders to solve out in the future. Very little has been done up to the present on this. The quick growth of Brahman calves is believed to be largely due to the fact that Brahmans are able to maintain a normal milk supply under conditions of climate that hinder other breeds of cattle.

The recent importation of four red Sindhi cattle, two bulls and two heifers from Guam, to the Beltsville Maryland experiment Station marks the beginning of a program to develop better dairy cattle for the South. These are a relatively small Zebu type.

In India, the little Red Sindhi cows, to be eligible for registration must produce 2,500 pounds of milk in 300 days. In a test herd in 1945, twenty-four cows averaged 2,768 pounds of milk in 293 days but when thirteen daughters, sired by Jersey bulls were crossed on Red Sindhi cows, they averaged 4,765 pounds in 382 days. The sire of one of the recently imported bulls and one female is out of the registered cow, Sindhi Queen, which made three yearly records averaging 7,488 pounds of milk containing 4.5 per cent butterfat.

"I find crossing Brahmans makes a large cow, good for either beef or milk," says D. C. Johnson of Lindsay, Louisiana. "They give as much milk as a Jersey, maybe a little more for a while, but they do not stay in milk as long."

Many dairy men are skeptical about the Brahman as a dairy animal. "The Brahman is strictly a beef type," they say.

### The Associations

In recent years there has been a good deal of pulling and hauling among the various breeders' associations. The oldest of the lot, the American Brahman Breeders Association, organized in 1924, is a registry association. Florida and other Gulf Coast breeders complain that since the ABBA is controlled by Texas breeders


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they are not getting a fair break in promotion. Because of this dissatisfaction a number of other associations have been organized recently, but the breeders are loath to split the registry and the ABBA continues to be the chief recording agency. Records and registry as well as promotion, as conducted by the various associations, it is said, are due for a shake-down in the near future. The associations and their officers are as follows:

American Brahman Breeders' Association: Afton Burke, President, Corsicana, Texas; Mrs. S. C. Border, Secretary, Hungerford, Texas.

Southeastern Brahman Breeders' Association: R. G. Herrmann, President, Box 278, Ocala, Florida; Aldus M. Cody, Secretary, Box 891, Kissimmee, Florida. (Non-recording.)

Louisiana Brahman Breeders' Association: Bob Jones, President, Slaughter, Louisiana; Harry P. Gayden, Secretary, Baton Rouge, Louisiana. (Non-recording.)

Pan-American Zebu Association: Hogue Poole, President, Cotulla, Texas; Ray Martin, Acting Secy., Cotulla, Texas.

"The Brahman Breeder-Feeder," one of the better breeder's magazines, is edited by E. C. Stone, grand old man of the Brahman industry, of Houston, Texas.

### Where Do We Go From Here?

Every Brahman breeder has his own idea and his own goal in mind. From the little nest egg of 250 imported animals, in about twenty-five years a majestic, big bodied purebred Brahman sire has been developed, two or more new breeds or blends of beef cattle have resulted from cross breeding, and practically every known system of crossing with every other breed of cattle has added increased size, vigor and disease resistance.

The government and private breeders will continue their search for fixed types adaptable to other region; there will be developed a dairy breed to produce the milk and butter so badly needed in the South; the North will try out more Brahmans in its feedlots; pastures will be improved. Brahman breeders will increase their purchases of purebred English breeds for their crossbreeding programs.

With the increasing high price of land and the growing scarcity of range worrying the cattleman, the Brahman has brought new hope by proving his adaptability to the hot, humid grazing areas that are difficult for other breeds of cattle.

### Acknowledgements

The bulk of the research and much of the literary work on this article was done by Mrs. C. Faye Bennett of Tulsa, Oklahoma. Mrs. Bennett obtained her information first hand on the ranches of Texas and the west.

Other contributors were E. C. Stone, editor of the BRAHMAN BREEDER-FEEDER; Milton Thomas, Sarasota, Florida; E. G. Herrmann, Ocala, Florida; and officials of the Bureau of the USDA.

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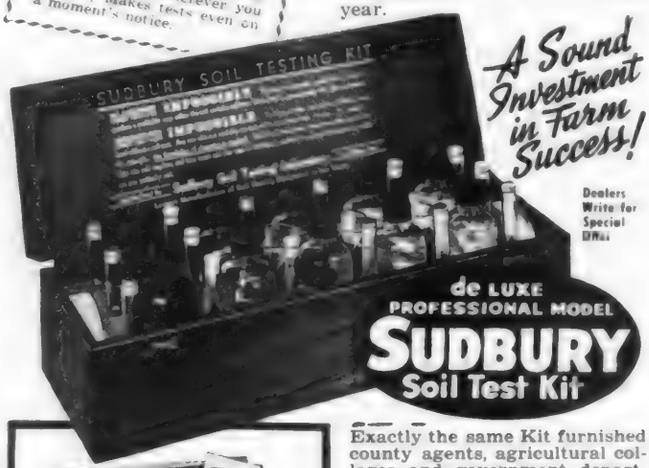
Much time, effort and money is wasted on wrong kinds and amounts of fertilizers. Sudbury Soil Tests make fertilizer produce up to ***3 times*** as much for the same cost. Order your Kit today . . . use it year after year.

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## ELECTRIC FENCE

(Continued from page 67)

| | |
|---|---|
| 250 line insulators, double-headed nails and leather washers @ $1.77 per hd | 4.43 |
| 250 clips to hold wire to insulator @ 39c per hd | .98 |
| 1 highline controller | 45.00 |
| TOTAL MATERIAL COST | $126.17 |

The cost of labor required to construct the three types of fences is not included because in many cases labor does not represent a cash outlay—fence building usually being sandwiched in between other seasonal activities. The time required to construct woven or barbed wire fences is frequently 5 to 6 times greater than the time required for electric fences.

### How To Put It Up

Proper construction of the electric fence begins with the setting and bracing of corner posts. The fence wire should be stretched tightly between the corner posts and the line posts then spaced at the required intervals along the wire. Line posts need not be driven deeply into the ground—there will be very little strain on them other than the weight of the wire. Ideal for line posts are 2" or 3" cedar posts 4 to 5 feet in length. They are easily handled and moved. For effectiveness, the wire should be kept taut; for appearance, the posts should be in a straight line. Corner posts should be heavier than line posts and must always be well-braced and anchored to keep the fence from sagging.

The distance between line posts is determined to a great extent by the contour of the land. On level ground posts may be as much as three rods apart. Sharply rolling ground necessitates shorter spaces between posts. The principal function of the post is to maintain the wire at the desired height, so a sharp dip or rise requires the use of an additional post to prevent the wire from being either too high or too low.

The same practice must be followed when fencing through ravines or washes. If the ravine is deep, one or two of the posts at the bottom must be well enough anchored to withstand the pull on the wire.

### Wire and Insulators

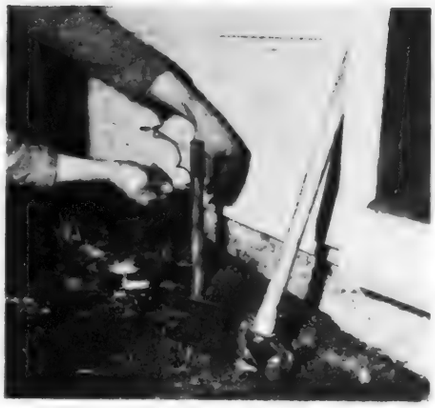
Manufacturers generally recommend the use of 4 point wire for electric fencing. The barbs, by penetrating the hair of the animal, make better contact with his skin. However, there are probably thousands of farmers using smooth wire with complete success. Light gauge wire can be used because it is subject to very little strain and is much easier to handle.

Insulators must be used on every post, on the sides of buildings or wherever wire touches a solid object. Insulators confine the current to the wire and can be easily attached to steel or wood posts. If punched steel posts are used, the insulator can be bolted on; if unpunched posts are used, the insulator may be tied on with a loop of stiff wire. All manufacturers and practically all of the dealers that handle electric fence controllers have complete lines of electric fence accessories, including various types of insulators, corner insulators, tie wires, lightning arresters, ground clamps, gate hooks and the like.

If it becomes necessary to join two pieces of wire together, always be sure that the splice is made so that the wires are very tightly bound together. It is important to remember that the splice is going to be required to carry the electric current from one piece of wire to the other. If a loose splice is made, the efficiency of the fence beyond the splice will be reduced. Also, a loose splice will cause spark jumps, resulting in radio interference. As a matter of fact, any loose connection, whether at the lightning arrester, ground clamp or splices on the fence, will cause spark jumps, which in turn are apt to result in radio interference. Rust is an insulator and must be scraped off at the point of the splice.

### The Electric Fence Gate

The most widely practiced method of building the gate is to dead-end the fence on corner post insulators at each side of the gate opening. This practice keeps the fence wires tight at all times and permits the gate to work freely. The gate wire is



THE GROUND WIRE from the controller should be firmly fastened to ground stake.

permanently tied to the fence wire on one side of the gate and hooked to the fence wire on the opposite side by means of a gate handle. A spring is usually used to maintain the proper tension of the gate wire.

When the gate is closed the current passes through it to the fence on the other side. However, when the gate is open, the fence from that point on is not charged unless an overhead wire or underground cable is used to by-pass the gate opening.

If the overhead wire is used, it should be carried on poles high enough to permit trucks or loaded hay racks to pass beneath. If the underground method is employed, lead covered or well insulated wire must be used and it should be buried deep enough to prevent heavily loaded trucks or wagons from cutting it.

In fence construction, it is comforting to know that the fence wire need not be returned to the controller from the far end of the fence. The wire may be dead-ended at any distance from the controller. The circuit is completed when an animal touches the wire and the current passes through its body to the ground.

### Training Livestock

The next step after constructing a fence is to introduce livestock to it. Emily Post insists that the guests be introduced before cocktails and dinner. Since our guests may not be familiar with Miss Post the cocktails may be omitted altogether, and the introductions made as our guests are attempting to snag an ear of corn. Two or three ears can be tied to the single strand of wire with baling wire, and some alfalfa or some other feed can be placed outside the wire. After one or two contacts with the wire, they will then have complete respect for it. This training period is extremely important, whether it be for horses, hogs, cattle or sheep. Of course every farm has a few head of stock that just don't give a damn. They'll go over, under or through any fence. For that class of bad boys the glue factory is the only sure confinement.

### Height of Wire

When fencing cattle or horses, one wire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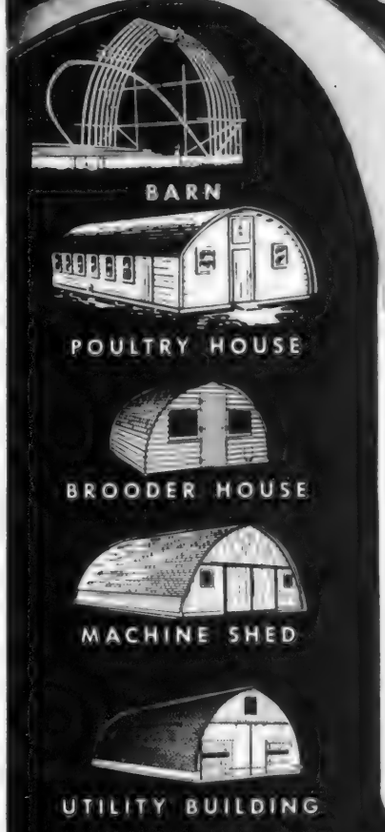


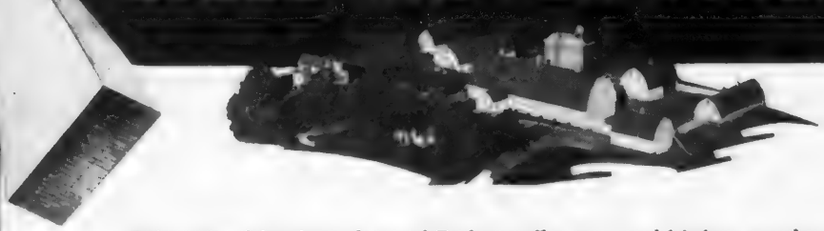

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Rilco Rafters are continuous framing members, running from foundation to roof ridge. Combining sidewall and roof framing in a single strong unit, they eliminate the weakest point of ordinary construction, the joint between wall and roof.

Rilco Rafters are shaped to provide more hay storage space in barns —post-free floor area in machine sheds—less overhead room to be heated in poultry houses, hog houses and utility buildings.

Rilco Rafter construction is wind resistant, strong, and streamlined in appearance. Factory built rafters are furnished ready for quick erection.

With seasoned lumber and modern structural glues, Rilco Rafters provide the modern building material.

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is sufficient. If hogs or other small animals are to be pastured in the same enclosure, two wires are necessary. The recommended wire height is two-thirds that of the animal to be confined. Avoid having the wire too high. Some users have installed the wire too high in an effort to forestall jumping only to find that the animals would go under the wire. Experience has shown that cattle and horses trained to the electric fence will not jump it.

Hogs of uniform size are frequently controlled with one wire. If a sow and her litter are confined in the same enclosure, two wires must be used. The lower wire should be 3 to 4 inches above the surface of the ground, and the top wire should be about 6 inches above the bottom wire. These spacings will ordinarily take care of anything from 6 week old pigs up to 500 pound sows.

Two wires have been found most satisfactory for sheep regardless of their size. Their wool partially insulates them from the shock of the electric fence, therefore, training is much more important. If the training period can be carried on just after shearing, it will be most effective.

For sheep and goats the lower wire should be 6 to 8 inches above the ground, and the top wire approximately 16 inches above the ground. It will be necessary, with goats, to use a third wire about 30 inches from the ground to prevent jumping. Animals properly trained to the electric fence do not usually jump the fence even though it may be low enough for them to do so.

Three wire fences usually have been found to be effective, not only in confining sheep but in repelling marauding dogs as well.

### Strip and Contour Fences

Representatives of the Soil Conservation Service of the U. S. Dept. of Agriculture have estimated that 50% more animals can be supported on the same acreage by proper use of the soil—pasture rotation, strip and contour farming.

The ease with which the electric fence may be erected or taken down makes it a "natural" for such purposes. Heavy, cumbersome fences are obviously unsuited for use where portability is required.

If the electric fence extends around the entire farm, temporary fences for pasture rotation, strips, contours, hogging down corn, etc. can be tapped in at any point along the wire without reducing the effectiveness of the fence.

### Added Protection

The electric fence has proved to be extremely valuable in protecting permanent woven or barbed wire fences. A charged wire run along the top, or extended 4 to 6 inches inside a woven wire fence by means of brackets, keeps livestock from riding down or pawing the woven wire fence out of shape. If one of the wires of a 4 or 5 strand barbed wire fence is electrified it will not only preserve the fence but will keep livestock from becom-

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Centa a.d. Franziskusklause

Both litters are sired by Bronze of Temagimi, a shepherd of unusual beauty and intelligence, and producer of the top war dog of England. One litter is out of Centa, a German import of exceptional style and temperament. The other litter is out of Midi, of the famous Clarandall obedience dogs.

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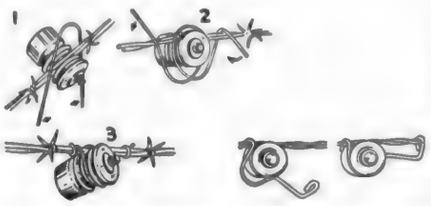
ing tangled up in the fence and receiving serious and costly wire cuts.

Hog farmers have found that a single strand of charged wire run about 3 to 4 inches from the gound and 3 to 4 inches from their woven wire fence will protect the woven wire fence from being uprooted.

A similar practice has saved many bull pens and exercise yards from being badly battered. A single strand of charged wire around the inside of the bull pen or




METHODS of fastening wire to insulators.

stallion corral will save the enclosure from considerable wear and tear. Some users say that such installations have a quieting effect on ill-tempered bulls. It is not recommended, however, to use only a single strand of electric fence for a bull pen.

Where neighboring herds are separated only by a line fence, disease is often transmitted by nuzzling or contact through the fence. An electric fence a few feet inside the line fence will prevent this.

### Not All Roses

The sting of the electric fence in an uncomfortable sensation to some people. If electric fences are used extensively, forgetfulness occasionally results in unexpected shocks. Where electric fences are used near riding academies, a person not familiar with them may ride his horse into the comparatively inconspicuous fence. When this or similar situations exist (golf courses, parks, athletic fields, etc.) a few pieces of white cloth or tags will make the one wire stand out.

Recharging or replacing batteries in controllers operating from such power sources is often a source of annoyance. Hot-shot batteries require replacement about every 3 months and storage batteries require recharging every 3 to 4 months. In most instances the dealer who sells controllers is not sufficiently informed or equipped to handle the servicing of them when and if it becomes necessary. A few electrical shops throughout the country are capable of servicing controllers but ordinarily the farmer must obtain a loaner from the dealer while his unit is returned to the factory.

Superstitions that might have been considered disadvantages 7 or 8 years ago, have virtually disappeared. The belief that electric fence shocks would sterilize animals, reduce milk flow or cause abortion, have never been substantiated by scientific evidence.

### Extra-curricular

Some of the uses to which electric fences have been put go beyond the fencing problems on the average farm.

For instance, several state game commissions are using electric fences to protect apiaries from honey-hungry bears and to keep deer and elk out of alfalfa fields or away from haystacks.

A pheasant fancier near Oconowomoc, Wisconsin, who raises upwards of 5000 birds each year, has used electric fencing to reduce losses to predatory animals. His enclosure consists of 1-inch poultry netting buried 6 inches in the ground and extending 18 inches above ground. Two-inch mesh is used from that point to the top of the 8 ft. fence. Prior to installing the electric fence, mink and weasels climbed up to and through the 2-inch mesh and large predators, such as oppossums and skunks, climbed over the top of the fence. Several hundred birds were killed each year by such raids.

A smooth wire was installed around the outside of the enclosure at the point where the 1 and 2-inch nettings joined. This wire was energized by a fence controller and predators soon lost their hunger for pheasants. Losses since using the electric fence have not exceeded 1 or 2 birds a year.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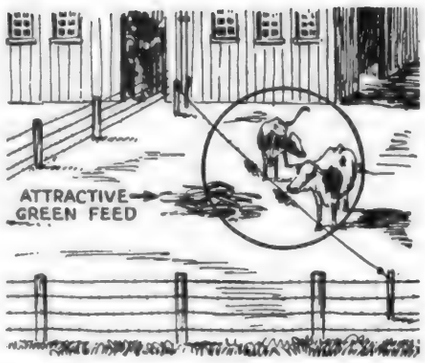


ONE WAY to educate stock; hold classes on electric shock in the barn lot.

Such installations are very effective because the predators are well grounded on the mesh fence by the time they reach the charged wire. Tracks in the snow one winter morning reconstructed the scene of a fox, belly low to the ground, stealthily approaching the enclosure. As he reached the fence he reared up on his hind legs and touched his forelegs to the charged wire. His next tracks appeared about 10 feet from the fence and indicated that he was going away—fast!!!

Electric fences have even popped up on busy main streets. A barber in a small Iowa town has become Public Enemy No. 1 to most of the local dogs—he electrified his barber pole!

## PRUNING AND SPRAYING

(Continued from page 72)

Extension Service bulletins that explain the various stages of bud, leaf and fruit development; radio recommendations for spraying are given by the Extension Service in most fruit raising communities. A phone call to the county agent's office will give you the approximate spraying dates.

There are many new sprays coming on the market, but for the present the spray programs on page 59 are recommended for the eastern and middlewestern farms. Here too county agents can advise on sprays suitable for local conditions.

A combination, general purpose spray is about ready to be marketed. It will be suitable for all uses except the dormant spray. The use of DDT as a spray is past the experimental stage for certain applications. It will control the No. 1 apple pest, the codling moth as well as oriental fruit moth worms, leaf hoppers and rose bugs. The only trouble with DDT is that it also kills the parasites which kill the red mites; then the red mites go on a rampage.

Success with a farm orchard for home fruit use depends on keeping the number of trees limited to a few of each variety. The mistake most people make is to plant more than they can properly care for; then the trees are neglected, and the yield and quality of the fruit are a disappointment.

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You'll also find use of these chains saves time during cultivating and haying. *Weed Bull and Weed Spiral Grip Chains keep your rubber tired tractors rolling when the ground is too wet to work without them.*

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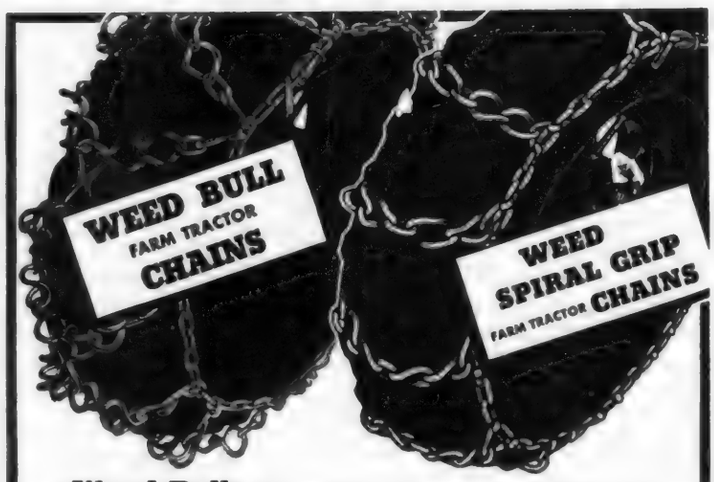


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AMERICAN CHAIN DIVISION
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*In Business for Your Safety*

## MILE OF FARMS

(Continued from page 22)

to try out Sudan grass I got this fellow over and asked him if wet sudan would poison my cows, as I had heard it would. This fellow says, 'Well, put the calves out and if it doesn't kill them, turn out the cows.' Now what do you think of that for advice?"

Proud grossed $9,000 on his farm last year, not counting the milk route, which Vance Mead, his hired hand, runs in addition to his regular farm work. Vance works 12-13 hours a day for $100 a month and house rent, meat, garden and milk free.

Proud's muck adjoins the Raona Farms stretch and as soon as labor is available it will go into beets or onions. Orval will figure out a way to get that done too—and knock off promptly at 12:00 o'clock for dinner.

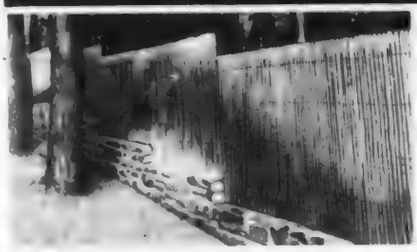
If Proud is the efficiency expert on the Mile, John Miller is the opportunist. Eleven years ago, after an indifferent career as a grocery store operator and a depression failure behind him, he bought his one hundred acre farm on the Mile. Opportunity came disguised as three husky sons and thirty-five acres of muck land. Miller had a hunch that if he could apply himself and his three sons to the muck land he could do better than the other farmers on the Mile with their old-time general farming. Someone told him that peppermint could be grown in muck and an analysis showed that he had the proper soil. Peppermint takes concentrated seasonal labor and that he had in his own family. Little by little he drained his own muck land and branched out into the neglected parcels belonging to his neighbors. Last year he farmed 127 acres in addition to his own, grossed $7,000 from sugar beets, $13,000 from peppermint and $3,000 from his cows and chickens.

Peppermint grosses $200 an acre. This includes planting, harvesting and distilling. When the peppermint harvest is on, the Miller family works around the clock. "Let me tell you," says Mrs. Miller, "when it's time to bring in the mint, I serve five or six meals a day and we just forget about sleeping."

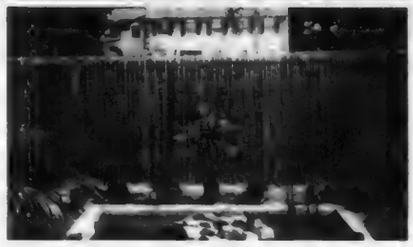
Miller figures that one third of the labor on the farm goes into sugar beets, one third into the peppermint, and one third into the cows and chickens. There doesn't seem to be any time left, but every farmer knows farming doesn't follow mathematics. Miller and his boys find time to harvest twenty acres of oats, sixteen acres of wheat, twelve acres of hay and take care of eight cows and thirty-five sheep. He has no hogs, but feeds all his grain on the farm.

Specialized crops like beets and peppermint take a lot of expensive machinery. There's close to $13,000 worth on the Miller farm, all paid for, in addition to a mint still which is valued at $4,000.


# FENCES FOR EVERY PURPOSE



**WOVEN (Domestic) PICKET** Made of half round cedar saplings in two types. In close type pickets are tight together. Cleft type has ¼" space between permitting passage of sunlight and air.



**IMPORTED FRENCH PICKET** Rusticraft makes the first importation of this famous French fence since 1941! In three heights 4 ft., 5 ft. and 6 ft. 6 in. Two types: Close type and Woven Cleft.

**POST AND RAIL** Made of selected hand-split Chestnut. This fence is available in both the 3 and 4 rail types. A strong, beautiful, long-lasting, all-purpose fence. Rugged beauty.

**SELF-LOCKING FIELD GATE** Protect valuable livestock from straying and damaging property. Gate locks automatically with a push from either side. Several widths. Ideal horseback gate.

**Rusticraft fences and gates will meet your every fencing need. Only the finest of selected timber is used. There is a Rusticraft gate to match each type fence. Prompt Delivery.**

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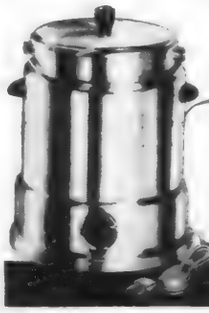

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The sugar beet lifter alone cost $1,500 and is the most expensive single piece of machinery. Most repair work is done in a farm shop, fully equipped.

The Millers are Catholic and the only church going family on the Mile. They have a good time farming. There's a deal of good natured banter passing around as they team up on the mint and the beets. The boys like farming. They subscribe to their father's theory that a youngster on a farm has a better chance for happiness than a city kid. "A city lad hasn't got a chance," Miller says. "Even if he wants to learn to work all he can find to do is to cut a two-by-four strip of lawn or wash the dishes for his mother. A country boy gets his hands into dirt, he watches things grow from seed to harvest, and he feels he's done something big. We make pretty good money here but we have a good time making it. In fact we have a better time working for it than spending it."

E. M. "Doc" Joslin practices farming as a way of life with sincerity and conviction, for all during the 37 years that he doctored sick cows and horses in Ingham County he dreamed of retiring to a little farm. His was no bookkeeper's dream of a few acres in the country, with the bookkeeper's fine disregard for realities. He knew the answers. Doc Joslin was born on a farm, and two score years of farm practice left him with no illusions. What he knew served to strengthen his conviction that a happy man is one who may have manure on his boots, but he doesn't have to punch a time clock.

Few farmers will think of forty acres as sufficient to provide even the modest wants for three people. Doc Joslin put by his pennies during the years he was "in business" as he puts it, but he doesn't touch that—it just gives him a feeling of security and safety, laying there in the bank drawing 1 per cent. He calls his 40 acres self-sufficient and probably sees no more cash than $800 from the farm from one year in to the next. His small fields are each treated like valuable pure-bred animals. "That's the way I get the best out of them without bleeding the soil," he says. He butchers a Hereford or Durham steer every winter, milks four Jersey cows, keeps a flock of chickens. He has a small orchard from which he gets all the fruit he needs and has some left to give away and sell. He works his garden. His farm freezer is always bulging with pork chops, rounds of beef and strawberries. He is a happy example of the farmer who doesn't make a nickel on his farm but has about everything good in the world that money can buy.

He approaches farming, especially the care of his soil and the handling of his stock, with the same scientific detachment that he went about his veterinary practice. He wouldn't trade farming for the best job in Detroit, but knows farming is not perfect. He reads a lot and he's come to some definite conclusions about what's

wrong with farming. With dry, good-natured assurance he says, "Farmers are in a rut; they've always had to take the other fellow's price for what they sell and pay the other fellow's price for what they buy. When a farmer produces a wheat crop, he should know about how much it cost him in seed, labor and investment. He should be in a position to add a reasonable profit to this, and name his price. As it is now he takes his wheat to town and is told what he'll get for it; he takes his money next door to the machinery dealer and is told what he'll have to pay for a binder to cut his wheat."

Doc Joslin thinks the farm bureau someday might figure out how to change all this. "You just watch them," he says, "they're smart and young and better educated. Some of these days they'll get the farmers organized and then we'll do the price setting."

Doc Joslin has two acres of muck land behind his woodlot. "If I were farming to make money, I'd make as much off those two acres as I do off this whole farm. At my age I don't want to be bothered."

Lawrence Locke, 35 years of age, with a wife and two children, is the "freshman" on the Mile. Locke is a mechanic and works in the shops in East Lansing, but lives on his 118 acres and has taken the first step to establish himself permanently as a farmer. Almost all mechanics everywhere dream of doing what Locke is doing, and he's going about it in much the same way as all mechanics do who take the first step. He saved his money, bought a farm and went into the chicken business. A mechanic just naturally hankers to get away from grease and wrenches. Locke says he's on a farm because it's the best place for his kids to grow up.

Scarcity and high price of machinery is holding him up, so he hangs on to his job in the shops and rents out his land. He has 250 pullets, seven months old, now laying. This flock provided the only cash income from the farm during his first year but he's accumulated five heifers, two bulls and three shoats and a collection of good second-hand machinery which is a start on complete equipment to work his farm when he gets around to it. He has a pretty good farm but isn't too happy about what might happen to the soil if he keeps on renting it. Orval Proud has forty-eight acres in wheat, pasture and sorgo; Fred Sober, down the road, has twelve acres of corn, and another man has nine acres in buckwheat. Proud and Locke cut thirteen acres of hay which they split. The grain and rent which he will take off the 113 acres at the end of his first year this June will add up to about $1,800. He's "joined up" with soil conservation practices because his father, who was a farmer also, was a great believer in rotations.

The soil man has told him that his twenty acres of muck will grow good beets but he doesn't like beets and doesn't plan to go into it. He thinks if his muck would grow peppermint he might like that, but as it is, he's letting the twenty acres of muck sit there because he "just doesn't like beets."

### The Church, The School

The church on the Mile vanished long ago when the congregation fell out over what color to paint the steeple; the two grocery stores lost their social significance when paved roads and the family car brought Lansing movie theatres a few minutes away; machinery broke up the threshing ring and the harvest dinners.

The little white school, where Miss Margaret Suttell directs the learning of 24 pupils in eight grades, is a survivor of those early American institutions which provided the social and spiritual provender of farming communities. For almost a century they vigorously moulded the thought and husbandry along the Mile.

In the fall of 1837 there was one farm on the Mile; a year later there were seven. The same number are there today, in this summer of 1947. Seven farmers are doing the same job in seven different ways, getting seven different answers to the problems of weather, crops and cattle, and that imponderable which some call luck.


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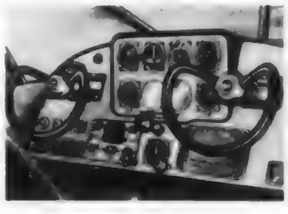

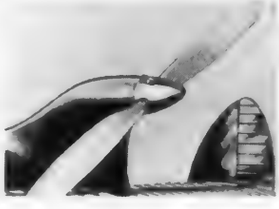

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## WORKING DOGS

(Continued from page 28)

At first, any dry warm spot in a barn can be used for his quarters. However, he should soon have a decent wooden kennel with a raised floor. He should be on a chain at night and at all times when he is not with you. A good working dog has neither the desire nor temperament to be a house dog.

Feeding a working dog follows the accepted practices for other medium size dogs. Until the puppy is six months old he should have three meals a day, thereafter, two meals until he is full grown, then he can go to a one meal a day schedule. Give him good food and his health and good growth will repay you.

In handling your dog there is an old bit of philosophy which runs like this, "If one can't teach an intelligent child through an appeal to his reason, one has no right to expect to pound education in through the seats of the pants". It holds for an intelligent dog, too. One never pounds anything into an intelligent dog by beating it, instead good qualities are pounded out. All of this leads up to the inviolate rule; be kind, be firm, and be patient. And to this should be added, be consistent.

Give your dog a name; shepherds like short names like Ben, Peg, Roy and Meg. The reason, of course, is to have a name that will carry well in the field.

Don't yell at your puppy. If the habit of expecting it is fixed, one can do a lot of yelling throughout the life of a dog and get little response.

As you start to teach the puppy, insist on quick response. A dog that is allowed to make a slow response will usually develop into an indifferent and a hard-to-control worker.

### The First Lesson

The dog's first lesson will be to "come in" when called; and when he comes give him a rewarding pat. If he is a little slow to respond one can readily fall back on that ever-present, gnawing hunger which is a part of every healthy pup. For a few times, a tid-bit in hand for him will bring him more quickly. Be careful, though, not to build up a constant expectancy.

Don't start to train your dog too young. All he need know up to six months of age is to come promptly when called. Best trainers go on the theory that it is better to wait until the puppy is old enough to do a little thinking and strong enough to do a little work. The first lesson to be learned should be simple, the time given to it should be short, but the pup must know it before one quits. Don't keep at the instruction until fatigue bewilders him. Don't try any training process with a pup when his belly is full. The mind is dull when the middle is stretched and heavy.

Many trainers recommend that the puppy be taught to "walk at heel" at an early age. Experience indicates that there

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is a chance of overdoing this training with the result that a pup is reluctant to run out. The pup should run freely; coming to heel is a simple thing to teach at any time.

### The Start Is Important

At about six months of age, a bit earlier or later as the pup's progress may indicate, he should be taught to "stop" and "drop" on command. Use any command you like, a whistle, word or sound. The whistle or hiss are possibly the best since they will never carry any feeling of anger. Always use the same signal for the same command. The initial training for the "stop" and "drop" are often given by having the dog on a leash. Pass the leash under the instep of the shoe and pull down gently while giving the command to drop. The puppy should have this lesson learned perfectly before one goes any further. The whole point is that, if one can stop his dog anywhere, anytime, training for any other accomplishment will go smoothly.

When the puppy manifests a full understanding he will "come-in", "stop" and "drop", when commanded, and if he is strong enough physically and has been out enough to be familiar with things around him, the time has come to start training in a serious way, with sheep.

Why use sheep for training? Why not cattle, or hogs, or any other stock? First of all, you are developing a Sheep Dog. He is bred for the job. He needs more of "what it takes" to make a good sheep dog than is needed for handling any other sort of livestock. If he is trained to sheep, and if he is doing his work properly, you can put him to any other sort of work later. You can't reverse the procedure. That is, one can't train on cattle where the mouth (in nipping and biting) is used and pull the bad habit out of the dog for sheep work. This practice may make the dog useless as a sheep dog.

If it is at all possible, prepare the stage in advance for the first lesson. It's a good idea to have several placid old ewes that can't readily be excited, or several quiet lambs, either of which will be likely to move off when the puppy approaches. It is important at this point not to have any sheep which will fight the puppy and scare him. After he gains confidence he will be able to take care of sheep of any temperament. Have the sheep in a fairly large field, a couple of acres or more. This first day is the puppy's and he can do what he wants just so he stops short of killing a sheep. Don't check him, don't yell, don't get excited. It is necessary, however, for the trainer to be alert so that the puppy won't get hurt. The sole object of this lesson is to get the puppy acquainted and enthused, and to acquire a disposition to move freely and boldly around sheep.

What should one expect? The answer is, anything one might expect from any other puppy. He may show interest and enthusiasm; he may run the sheep all over the lot; he may show no interest at all. It


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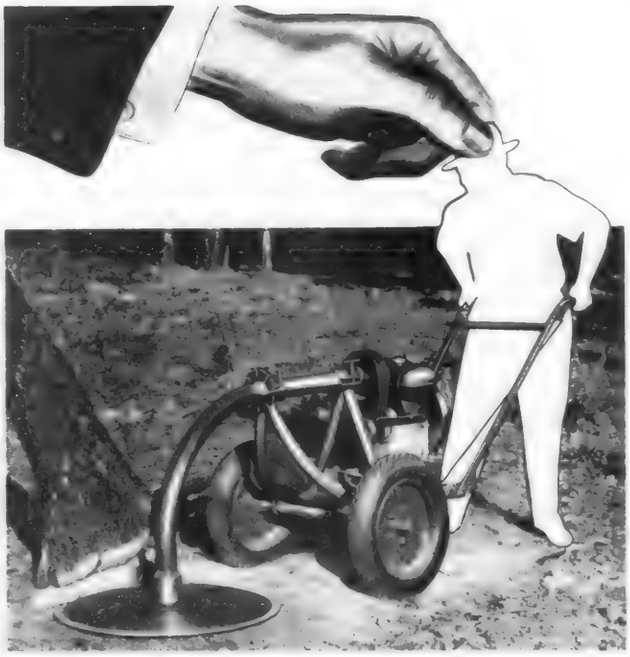

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doesn't make any difference. You, as the trainer, are actually appraising the puppy and getting your bearings as to what work lies ahead. The over-eager puppy will have to be held down; the one clearly of the opposite temperament will need to be encouraged to take up his job. The whole thing is to learn all you can about your pupil.

### Sheep Dogs Don't Bite

After the first meeting with sheep, the next step is to take the dog to a small flock of ewes, preferably have them along a fence or in a corner of a field. "Drop" the puppy on command, and then walk into the sheep, and, if possible, get one or two sheep to start moving off. It is nearly a 100 to 1 bet that the puppy will move to turn them back, and that is the first step in developing the instinct to "gather" and "fetch". Keep the puppy wide, out from the sheep. Do this by stopping him when he gets too close. If he is kept wide he will rarely ever develop a bad mouth (that is the disposition to grip or bite). If he charges and grips, take time to see that he learns at this point that his mouth is not for biting the sheep entrusted to him.

Scatter the sheep several times and keep repeating the lesson until the dog learns to hold the sheep together in a compact group. Drop him frequently so that he gets used to the command and responds promptly. Also, at this stage, the apt pupil may be taught the rudiments of moving to the right and to the left. Have a definite command for each movement, such as "come away" for the right and "come 'ere" for the left. Likewise, if the pupil is eager and attentive he may be taught to "walk in" closer to the sheep as well as "go back" to locate himself farther away. These four commands will be used later to place the dog in any desired position to the sheep he is working.

It is unwise to overdo training for control at an early age, as well as unwise to stay at any lesson too long. Too much control commanding without movement of the sheep may develop a young dog into a mechanical robot that is useful only when his master is at hand to do the directing. The double objective is to train the dog to do his work properly and also to act correctly on his own initiative when need arises. Just as soon as the dog shows obedience to command, a little understanding of movement in the four directions named, and has had a few turns at "heading" and "holding" he is ready for the next phase of training which will be to "gather" and "fetch".

Many well-bred puppies will show a disposition to go around sheep and fetch (bring) them to his master which is quite instinctive. If the puppy turns out to be one of that sort there will be a few problems in training for this work. Sometimes, however, another inherent quality called "eye"—a fixed gaze which the dog employs toward all sheep while working—is more strongly developed than the inclination to go around the sheep. The strong-eyed puppy very frequently will show a disposition to go directly into his sheep. This quality, more than any other single quality, seems to baffle many beginners. Some encourage the "posing" until it is difficult to break away from it. Others resort to the throwing of pebbles, sticks, corn-cobs, or what have you, and even resort to punishment of the dog, to try to overcome the disposition which comes about through the dog having a very good quality. It isn't difficult to handle the strong-eyed puppy if one uses the correct procedure at the very beginning. Regardless of whether the puppy is a free-running kind or the strong-eyed sort the training to gather and fetch starts from the same set-up.

Place a half dozen or more placid old ewes, or some quiet dispositioned lambs, in the center of an open field. The trainer and his dog take up their position some 50 or more feet away from the sheep. Bring the dog in behind you and command him to stop. The trainer moves forward toward the sheep a few feet or even a few yards, and in this way places himself between the dog and the sheep. By raising the arm and giving such command as "come away" if the dog is going to the right ("come 'ere" if to the left), the trainer tries to make it clear to the puppy that he is to run around the sheep to "head" them. If the dog doesn't catch on at first just keep moving a little

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closer to the sheep all the while, urging the dog at the same time. As the man-dog combination get closer and closer the sheep eventually will start moving away; and the chances are that the puppy's early lesson in training to "head" and "hold" will appear, and he will be around the sheep in an instant. If he runs wide every thing is fine and it only is a matter of repeating the lesson until the dog runs freely from any location selected for the start. If the dog has run close on his first trip, or has shown a disposition to draw in, then it is time to start correctional training procedure at once. The dog, the man, and the sheep assume the same positions as already described. If the dog comes in directly toward the sheep block him, and make him go wide. If he starts his run too close, the trainer should run forward and outward, thus forcing the dog to go wider. As the dog goes around the sheep, the trainer drops back to his original position. A few lessons at this, with the command "wide" at each urging and blocking, and the dog will soon catch on. It is imperative at the outset for the dog to learn that he is always to go wide around his sheep. Later, if he has never been allowed to draw in, or to run close-by, and even though he may come directly onto sheep someday on a "blind" gather, he will immediately cut a half-circle to get beyond his sheep, simply because his basic training never allowed him to do otherwise.

The ideal "outrun" or "cast" puts the dog out and around his sheep in a wide semi-circle which should carry through until the dog is just a little beyond center of a position directly opposite the handler. This slight over-running gains a position in which the dog can readily check any tendency of the sheep to drift sideways; a movement usually arising from the sheep having caught a glimpse of the dog on his outrun. When the dog reaches this just over center position give him the signal to stop. The dog should stop to "catch his wind", as they say, and especially after a long outrun in very hot weather. Also, stopping for an instant steadies the dog before he makes the "lift", allows him to get "balanced" on his sheep, and makes it possible for the dog to introduce his presence in a cautious manner without frightening the sheep. If the trainer gains these points in this basic training period he will never need fear frightened sheep which may scatter to the four corners of the field.

After gaining his position beyond the sheep the dog is next urged to "walk in", and as he comes up slowly, and if he holds his sheep together as he was taught earlier, the sheep melt off the dog, start moving away, and the dog is guided to bring the sheep to the handler in a direct line. If the dog gets too close on the fetch, hold him back by stopping him, and if the sheep move off at an angle, call the dog up to "flank" the movement. This is why

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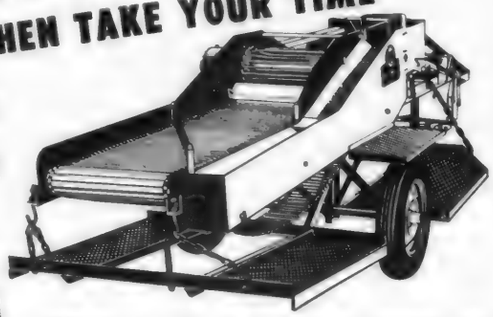

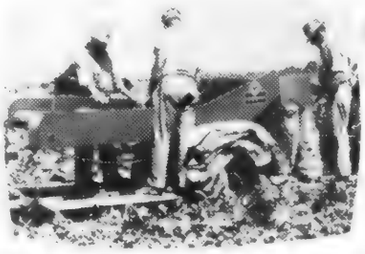

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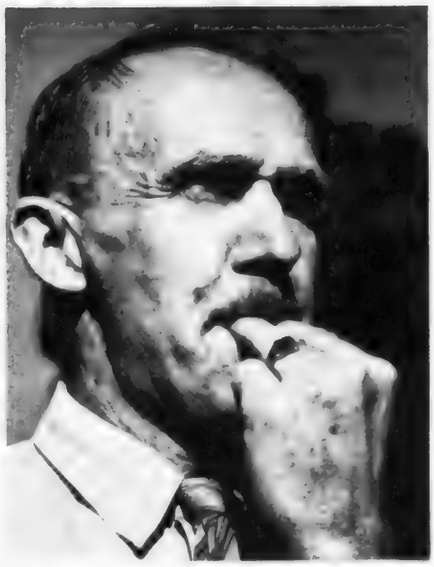

THE WHISTLE is a good signal for working dogs in the field and carries above noise.

he was earlier trained to "right" and "left". Experience and practice make for perfection; give the dog lots of it before going on to the next step, "driving".

### Driving Must Be Taught

Teaching a dog to "drive" away is sometimes a bit difficult because it reverses every instinctive urge within the dog as well as everything the dog has been taught up to this stage. This is another stage where training programs sometimes go awry. If some care, understanding, and patience are exercised training a dog to drive isn't difficult. Place some sheep up along a fence at the edge of a field. The trainer should take his position just back of the sheep but on the opposite side of them from the fence. Here again that the trainer is in a position to block the dog if he attempts to come around them. Place the dog back of the sheep, and give the same command "walk in" that has been used all along to get the dog to approach his sheep. As the dog walks in toward the sheep, they start to move away, and the dog-master-sheep combination moves at one time. When the dog catches on a bit, the trainer can gradually drop back. Soon, the dog is going forward with his sheep. After the rudiments are understood then the training is moved out into the open field. When the dog understands the commands to move "right" and "left" and "walk in", it again becomes a matter of experience and practice that makes the dog expert at "driving".

Training a dog to "pen" sheep in a small enclosure has many practical uses on the farm. It is often employed in moving sheep from one field to another, first in getting the sheep out the gate and then getting them into he field to which the sheep are not accustomed. Likewise, it is used for putting sheep through doorways in barns or sheds. If one continues


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"I HEAR your whistle boss, but I can't come now. We just sat down for dinner."

this training long enough the dog can be used effectively to load sheep onto a truck even in an open field. Nothing new in the way of commands beyond what the dog already knows is introduced. Training to "pen" simply intensifies and perfects the work of holding and forcing. Some people think that training to "pen" is only a fancy point for trials work; it isn't. It is one of the most useful accomplishments of a good, sedate working dog.

In training to pen the dog is taught to be steady, cautious, courageous and forceful without any show of savagery. And he must be instantly obedient and responsive.

A dog really accepts only one master. He must be handled from the very start to intensify this bond of understanding and devotion. Only the dog's master should attempt any part of the training program. Don't nag him; give him praise at every point where he does well. Develop a word to impart your feelings such as "good dog", or, "good work", and use it often. The dog should never be punished except for doing very wrong, such as biting or defiant disobedience. Even then the dog should not be struck. Take him by the scruff of the neck and shake him a little, at the same time let the voice sound a little harsh. If you always have been quiet and calm, and the devotion is strong the dog will come up licking your hand, thoroughly punished, and simply asking, "what's next", "let's try it again".

Any person who strives to understand just what qualities have been bred into the dog, and how the dog's mind works, can expect to be successful in training and developing a good, sedate, livestock-working dog. It may take a little time each day for a few months, but the end result will be a willing, capable worker that knows no quitting time, asks only good food and decent quarters as pay, and has only one great ambition in life, to please his master.

## ROUNDWORMS IN HOGS

(Continued from page 85)

sow is removed and the young pigs grow up in comparative safety. It is a good idea to treat the sow for ascarids at a suitable time *before* farrowing so that she doesn't contaminate her own litter.

Another precaution in the control of

SORT HOGS for size when treating with Phenothiazine in their feed.

ascaris is keeping the rat population to a minimum around the farm. Recent investigations have shown that rats may feed on pig feces and spread ascaris eggs in the droppings.

If your pigs become infected in spite of your sanitary management, then you have a second barrel to your gun. It is medical treatment. Combined with sanitary practices, which are aimed at the


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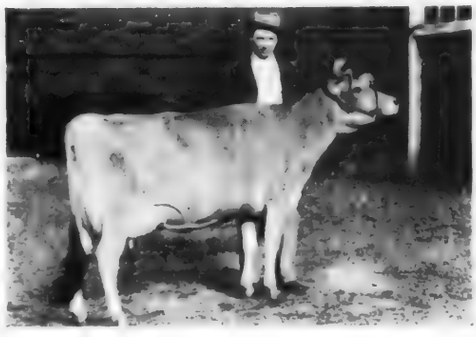

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prevention of re-infection, treatment is very effective. Removing the mature worms decreases the number of eggs which might reach the soil. It's nice to know that on the removal of the parasites the animals recover promptly and gain weight, which is the difference between profit and loss.

Under any circumstances treatment for the swine roundworm should be administered, or at least be under the direct supervision of a competent veterinarian. Many drugs are vitally poisonous and injurious to pigs unless the dosages are properly adjusted. Exact dosages are usually prepared by careful calculation on the basis of body weight and physical condition of the pigs to be treated. Drugs are usually administered by a dose syringe, stomach tube or capsule or placed in drinking water or feed.

Treatment by itself does not solve the problem of roundworms. Once the worms have been removed from the pigs, constant vigilance should be continued to prevent and guard against reinfection. One is not effective without the other.

Sodium Fluoride has been recently reported by the United States Department of Agriculture as a reliable treatment for roundworms. In the past, oil of chenopodium mixed with castor oil was widely used, but as a rule was not more than 70 per cent effective. A little later Phenothiazine was discovered. This wonder drug for sheep parasites, used extensively because it is easily administered, only removed about 50 per cent of the worms in treated pigs. Phenothiazine can be given in the feed, usually mixed with four to eight times its weight of dry ground feed, without fasting. In this way, several pigs can be treated at one time. It is the only drug available for nodular worms in hogs, the same dosage being effective for both.

It is recommended that a limited number of animals be treated at one time and that those animals be fairly uniform in weight and age. The maximum treatment recommended at one time is ¼ pound of Phenothiazine mixed well with the regular feed mixture for 35 thirty-pound pigs, or 25 forty-pound pigs, or 20 fifty-pound pigs, or 15 seventy-five pound shoats, or 10 one-hundred pound shoats. There should be sufficient room at the feed trough for all the animals in a group to feed at the same time.

Pigs, particularly those under three months old, sometimes react to Phenothiazine by developing blindness and mild paralysis of the legs. While these conditions usually wear off in a day, care should be taken to follow directions and over-dosing should be avoided. Hogs over five months old seldom show any ill-effects of treatment.

Sodium Fluoride is also administered in the feed. It has one distinct disadvantage; it is highly toxic to man and animals. Consequently, directions must be carefully followed, preferably by a competent vet-


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erinarian. Sodium Fluoride is best used as a one per cent mixture with *dry* ground feed. (One pound of Sodium Fluoride with 100 pound of dry feed). The animals should not be fasted before treatment. On the day of treatment, about one half the medicated feed is given in the morning and the other half in the afternoon. The total weight should be the amount the pigs will clean up in one day. If any medicated feed is left the following morning, it should be thoroughly mixed with the next day's feed and the regular feeding program followed. No purge is necessary with this treatment. Pigs may be treated twice with this drug, once when they are eight to sixteen weeks old, and later at four to six months old. Do not use Sodium Fluoride with wet feed, or change the dosage, or use medicated feed for more than 24 hours. The margin of safety of this drug is very small, so rigid precautions should be taken to insure proper administration. Thorough mixing is a prime factor. After shovel-mixing the medicated feed, it can be placed in a barrel and rolled around to complete the job.

There appears to be no residual or accumulative effect on pigs from this drug if not more than two treatments are given. It should be plainly marked *poison* and kept out of reach of children and animals. The greatest danger is that it may be mis-handled and find its way into the human body where it is a quick and thorough silencer.

Roundworm control is simple to understand but its execution does require some sweat and muscle. When it puts quicker fat on your hogs you may even be ahead on labor, and your pocketbook certainly will be in better shape.

---

## TENT TOBACCO

(Continued from page 43)

ports. It is in reality a light canvass.

A tobacco tent lasts one year. However, the tops each year are taken down and used to make the sides of the tents for the next year. In 1946, new tobacco tent cloth cost 5¾c per square yard. There was a slight increase in 1947. At 5¾c per square yard, cloth to cover an acre cost approximately $275.00. To this must be added the value of the old cloth which is used for the sides of the tent. This would bring the total cost to a maximum of $325.00 for cloth. It requires from 40 to 50 posts to construct a new tent. Posts cost 90c to $1.00, each. From 250 to 300 pounds of No. 6 wire is required for an acre. Wire cost 4½c a pound in 1946, bringing the price to $15.00 per acre for wire. Adding up the cost of all materials, the price of a new tobacco tent for an acre would be around $250.00 or $375.00. The cost of labor to dig the holes and string the wire and cloth is high so that for materials and labor the cost for an acre would run to $450.00.

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Posts and wire are left in place year after year so that after the first installation cost, there would be a yearly cost of labor plus the value of the new cloth.

Tobacco can be grown under cloth everywhere that it grows in the open. The requirements are the necessary cash to finance the project and the courage and initiative of Ariel Mitchellson.

Ordinary rain and wind storms cause little or no damage to tobacco tents. In fact, tobacco tents that are made of good cloth which has no holes or tears in it, will withstand very hard wind and rain storms without damage.

Tents are built in April after the worst storms are over. Sometimes wet snow storms blanket the cloth and practically close the mesh of the cloth and then very strong wind storms do cause some damage. Such snow storms occur very infrequently and seldom if ever occur generally over the whole Connecticut Valley.

There is some damage to tobacco tents almost every year from bad hail storms. In all tobacco tents the cloth between the wires sags naturally, due to its own weight. In the case of bad hail storms, the hail stones roll and bounce into the sag of the cloth and because of their excessive weight cause damage by tearing the cloth. Tobacco tents will withstand light hail storms without damage.

Hail storms usually cover narrow strips of country and are often very localized. Since there over 8000 acres of shade tobacco grown in the Connecticut Valley, scattered throughout a wide area, the damage caused by hail storms almost every year is relatively small. Hail storms seldom occur in any area more often than once in several years. Some places have never had any hail storms. As a result, most growers suffer damage either not at all or very infrequently from hail storms.

Tobacco tent poles and wires are left in place year after year. Tobacco cloth is removed each year at the close of the growing season and replaced each year before tobacco is planted. This is not done however, because it has been damaged by storms. The effects of natural weathering would weaken the cloth sufficiently that it would not withstand all winter snows.

Once in a while a humdinger of a storm comes along, a freak, and all bets on durability of tobacco tents are called off. In early May, 1945, a heavy wet snow blanketed the cloth of tobacco tents and the very strong wind that accompanied the storm caused heavy damage to many tents in Massachusetts by ripping the cloth and breaking the post of the tents. In 1946, a freak wind storm in one small area in Massachusetts near Amherst caused damage to one plantation. This was more than an ordinary wind. And almost every year bad hail storms cause some damage to a few tobacco tents here and there throughout the Connecticut Valley.

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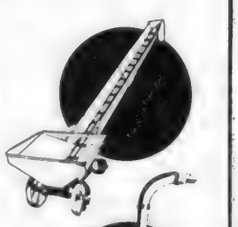

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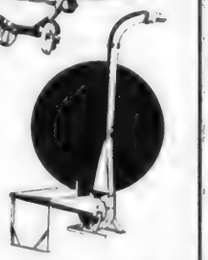

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WRITE FOR INFORMATION
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A COMPLETE WELDING SHOP FOR THE FARM

Mid-States METAL ZIPPER

**The** Mid-States Metal ZIPPER with accessories and attachments shown below, equips the farm with a complete welding shop. Permits welding, heating, brazing, cutting, bending, soldering and all other operations. No need to go to town and wait for expensive repairs. Do it yourself right on the farm with a Metal ZIPPER.

**Ease** of operation and automatic arc permits any farm hand to do good welding right from the start with a Metal ZIPPER. It's the one arc welder that works perfectly without the guidance of an expert.

**For** quick, easy repairs and to avoid costly delays, maintain your farm machinery and equipment with a Metal ZIPPER.

**The** Metal ZIPPER illustrated above with attachments is built to withstand rugged use. It's portable . . . wheel it about with ease. Lengthy cables, helmet and all other accessories and parts are of highest quality. 9000 Arc Torch provides a low-cost electric flame which is approximately 2000° hotter than acetylene. No need for dangerous gas welding equipment. Do it all right on the farm, with this best of all, easy to operate arc welder . . . the Metal ZIPPER. Write for complete facts today . . . no obligation.

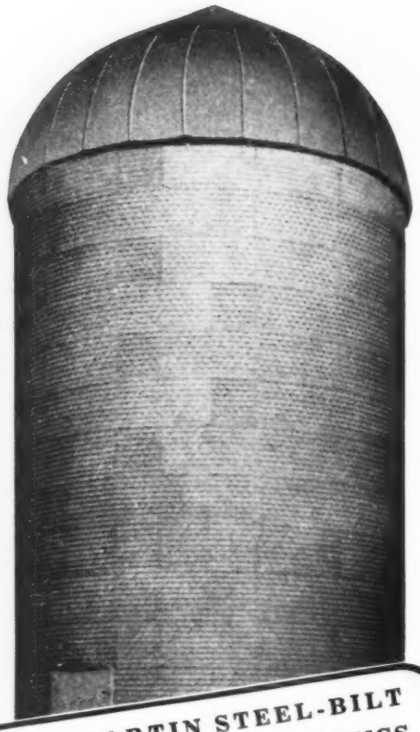
*Ask for the Name of Your Nearest Mid-States Dealer*

Mid-States EQUIPMENT CORPORATION

2427 South Michigan Avenue, Chicago 16, Illinois

# THE MARTIN HAYMAKER

## *The Practical, Profitable Method of making better hay at less cost*



The Martin Haymaker has brought the benefit of modern science and research to the age old problem of haymaking. It takes its place with other modern and improved farm methods and machinery. In less time, and with a fraction of the labor previously required, hay can be stored while it is still fresh and high in food value. And it keeps it that way. For dairy farmers it means higher, more even year around milk production. For meat producers it provides high value, low cost stock feed during the winter months. In all cases it means greater farm profits.

### HOW THE MARTIN HAYMAKER WORKS

The Martin method takes the hard, dirty labor out of haymaking. Hay may be gathered the same day it is cut -- chopped and blown into the Haymaker where forced ventilation reduces water content to a safe storage point. Food value is unimpaired because the hay is the same as the fresh grasses minus the water. All the nutritive leaves are saved. The bright green color, the carotene and vitamin A are retained. You can see and smell the difference. But the real advantages appear in higher meat and milk production. Livestock will eat more of this high food value hay.

### OTHER IMPORTANT ADVANTAGES

The Martin Haymaker offers users other important advantages over the conventional haymaking and hay storage methods. Gambling with the weather is eliminated. Because hay can be stored when cut it needn't risk mildew and rot in windrows in rainy weather.

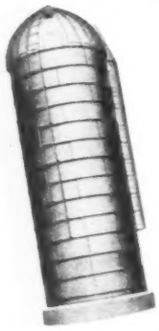
Haymaking is simplified. Handling is reduced to a minimum. Storing the hay in the Martin Haymaker takes only one half the time and one third the labor required in conventional mow storage procedure.

Martin Haymakers eliminate the fire hazard that generally threatens the conventional hay storage facilities. The metal structure is fireproof and there is no record of spontaneous combustion ever occurring in a Martin Haymaker.

### MARTIN HAYMAKERS ARE NOW AVAILABLE

Use the attached coupon for complete information on the Martin Haymaker. And remember, Martin Steel Products Corp. is the pioneer in metal farm buildings. They make a complete line for every farm purpose. We will be glad to send you details on request.

### OTHER MARTIN STEEL-BILT FARM BUILDINGS



#### THE MARTIN STEEL-BILT SILOS

Various feeds may be processed as silage. Fresh cut grass or hay too wet for storage can be placed immediately in the silo. The Martin Steel-Bilt Silo is the best and safest design. Used with the Martin Haymaker it makes an ideal feed storage system.

#### MARTIN STEEL-BILT CRIBS AND BINS

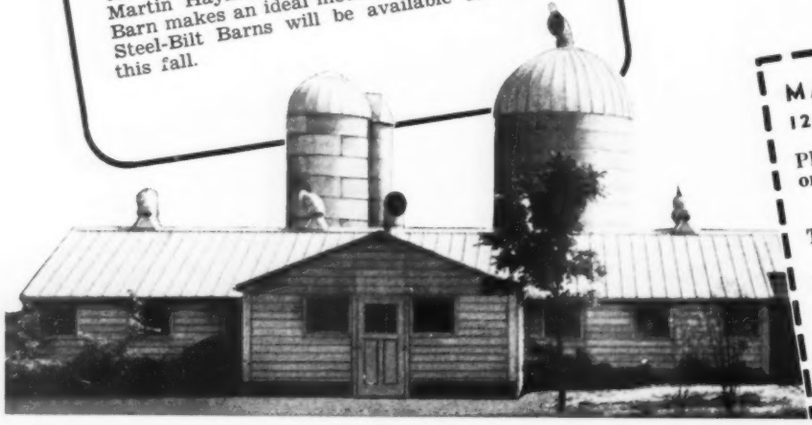
Corn and grain stored in Martin Cribs and Bins are safe from rats, vermin, fire and weather. They are scientifically built and ventilated for quick curing. Rugged and durable.

#### MARTIN STEEL-BILT BARNS

Labor saving, convenient and comfortable quarters for stock both summer and winter. With Martin Haymakers and Silos the Martin Dairy Barn makes an ideal modern farm plant. Martin Steel-Bilt Barns will be available for delivery this fall.

**STEEL MARTIN Farm Buildings -BILT**

HAYMAKERS · SILOS · DAIRY BARNS · CORN CRIBS
FEED STORAGE BUILDINGS · POULTRY HOUSES



MARTIN STEEL PRODUCTS CORP.
120 LONGVIEW AVE., MANSFIELD, OHIO

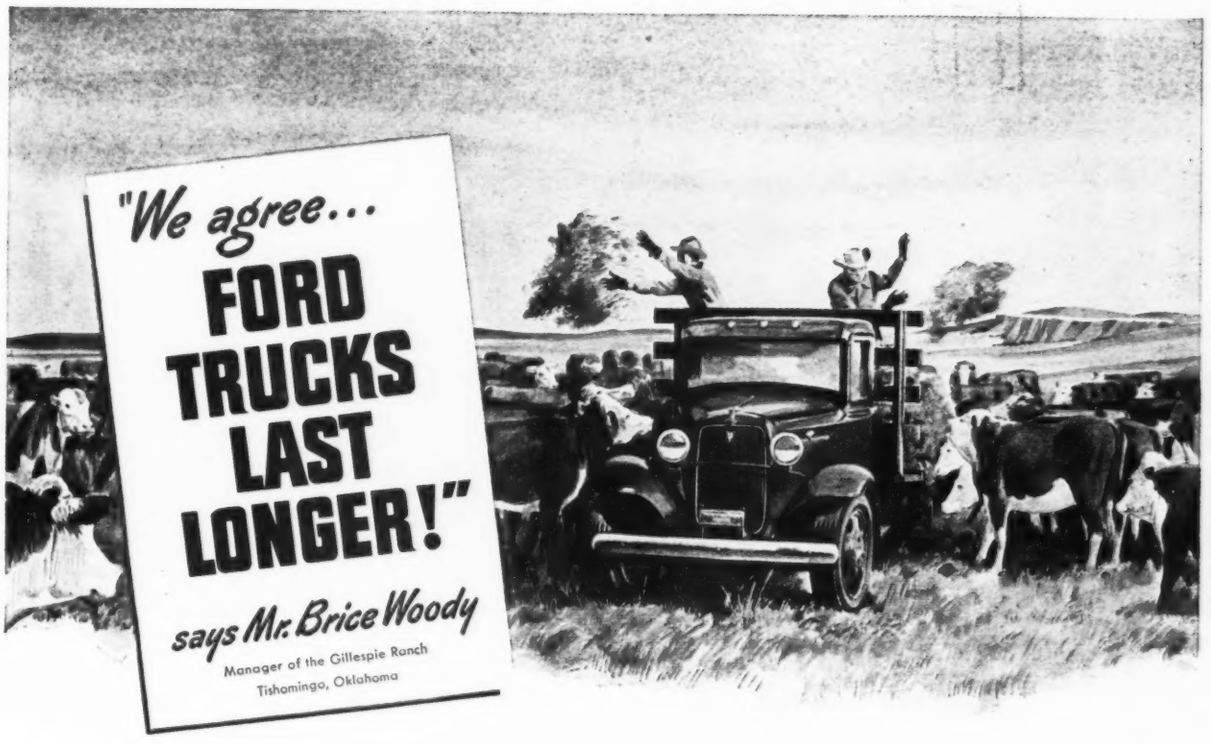
Please send me, without obligation, full information on the following Martin Steel-Bilt Farm Buildings

Type of Building _____

Name _____

Street or RFD No. _____

City and State _____



"We agree...

# FORD TRUCKS LAST LONGER!"

says Mr. Brice Woody

Manager of the Gillespie Ranch
Tishomingo, Oklahoma

**"Cattle ranching is tough going for a truck—** but our 1934 Ford is still doing its job in fine shape. This truck covers a beat of 10,000 acres, so you can be sure it's kept mighty busy hauling ensilage to 1,500 cattle over really rough terrain, as well as hauling supplies from town.

**"Through summer heat and winter blizzards—** we keep this truck on the go. It gets the feed to our animals no matter how bad the weather may be. We haven't had a bit of trouble with it. It's always ready to go. We're mighty glad that, with conditions the way they are, Ford Trucks Last Longer."

## REGISTRATIONS SHOW IT, TOO!

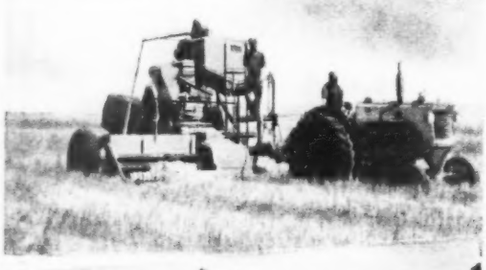
Latest 1946 registration figures show that Ford Trucks last longer than any of the other four sales leaders. These figures show the average age of *all* Ford Trucks in use today is more than 9 years . . . and that 78.4% of all 1936 Model Ford Trucks in use 9 years ago are still on the job. That's up to 15.8% better than the records of the next 4 sales leaders!

### Only Ford Gives You All These Long-Life Features!

Your own pick of power—the rugged V-8 or the brilliant SIX • axle shafts free of weight-load—¾-floating in light duty units, full-floating in all others • new Flight-light 4-ring, oil-saving pistons • semi-centrifugal clutch • rolling-action, low-friction steering . . . more than fifty such endurance features to make your Ford Truck Last Longer. See your Ford Dealer now!

**MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE!**

# The HARVESTORS EXCEL



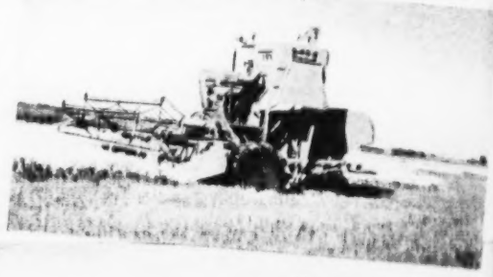
## MIGHTY MASTER OF ALL CROPS

MM HARVESTORS are the choice of progressive farmers who demand *all* the quality features that assure an economical job of harvesting *all* the grain and seed crops under *all* combining conditions. Lowest cost harvesting per bushel, per acre, and per dollar invested is the enviable reputation established by performance records of MM HARVESTORS.

All HARVESTORS have the special MM "straight through" design . . . threshing, separating and cleaning in one continuous straight through operation. Rasp cylinder and concave of all steel welded construction *thresh the grain with a gentle rubbing action.* Simplified V-belt drives are positive in operation and easily adjustable for cylinder speeds to meet all combining conditions for all grain and seed crops. Ball and roller bearings on all high speed shafts or those carrying heavy loads or end thrust. Bell crank sickle drive operates on roller bearings. Copper bearing sheet metal and quality construction throughout offer long-life, *low-cost performance that excels.*

Scour-Kleen attachment, verticle sickle bar, screenings attachment, sacking equipment, pickup attachment and other optional equipment quickly adapt the HARVESTOR to all combining or threshing needs and make it the leader in low cost, efficient harvesting . . . a MODERN MM MACHINE that excels on every job.

The MM HARVESTOR is a product of the precision design and engineering skill that are built into every piece of equipment bearing the MM trademark . . . MODERN MACHINES BUILT TO DO THE WORK *economically, efficiently, safely.* Get all the facts from your friendly MM dealer.



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